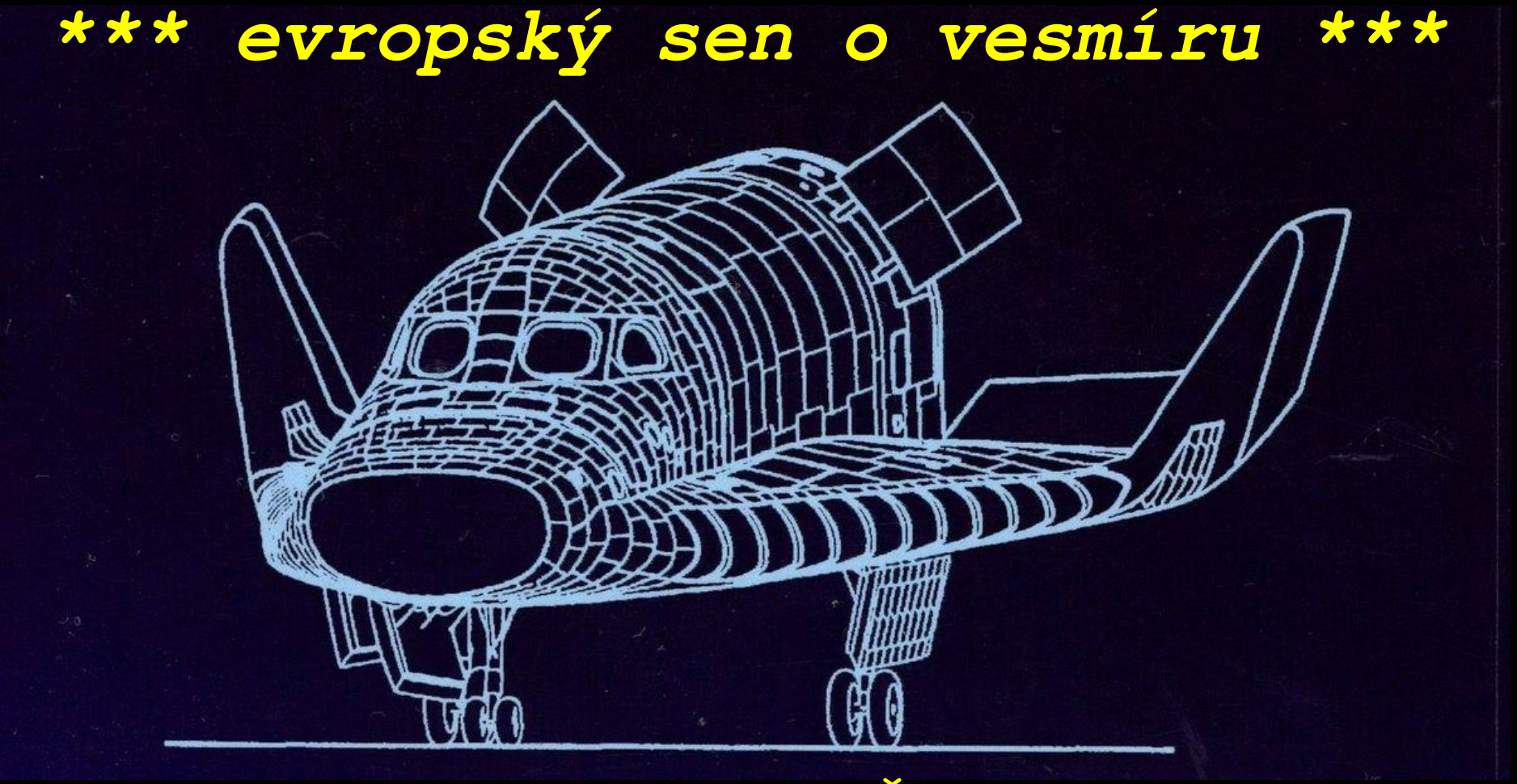
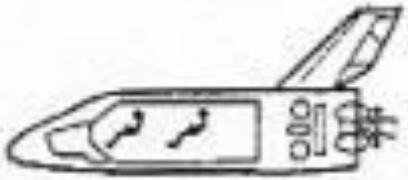
Raketoplán HERMES

*** evropský sen o vesmíru ***



Ing. Tomáš PŘIBYL
tomas.pribyl@seznam.cz
www.kosmonaut.cz


ariane
esa
cnes
esa
hermes
cnes



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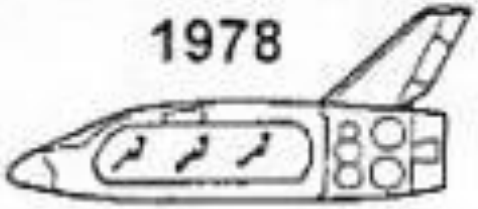

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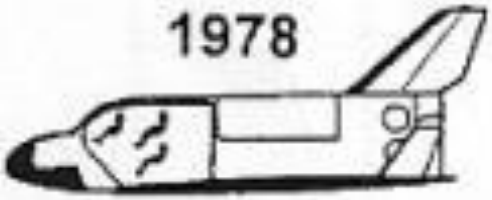

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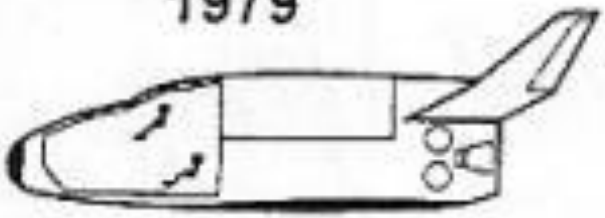

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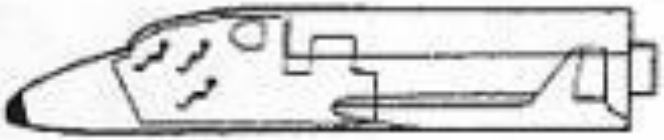

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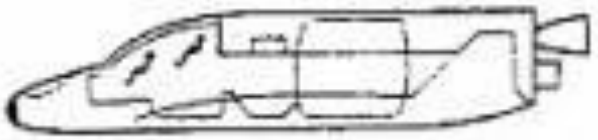

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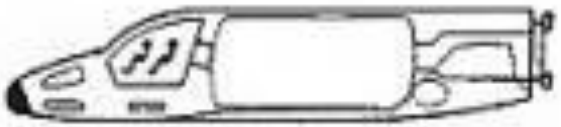

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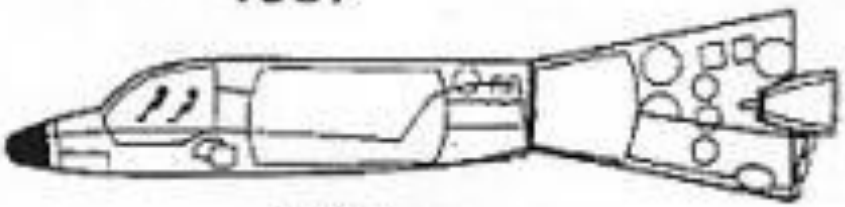

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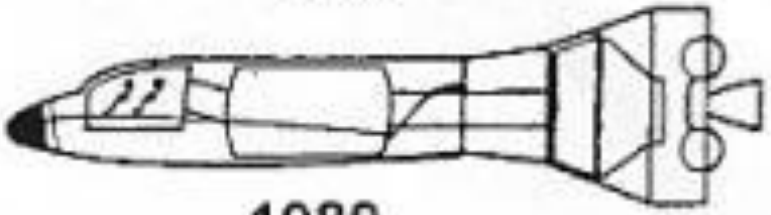

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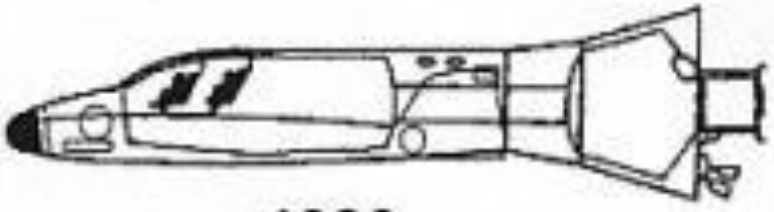

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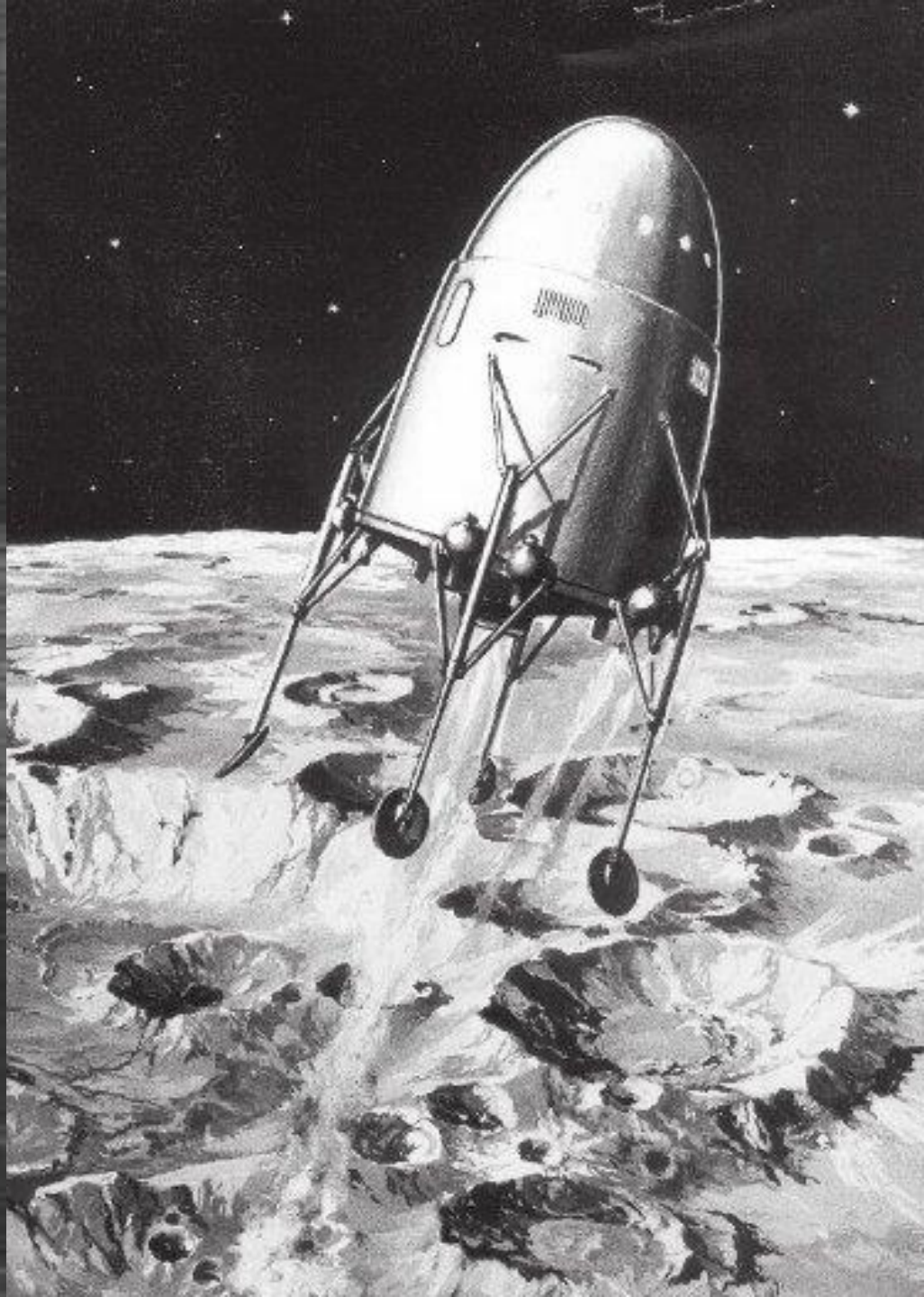
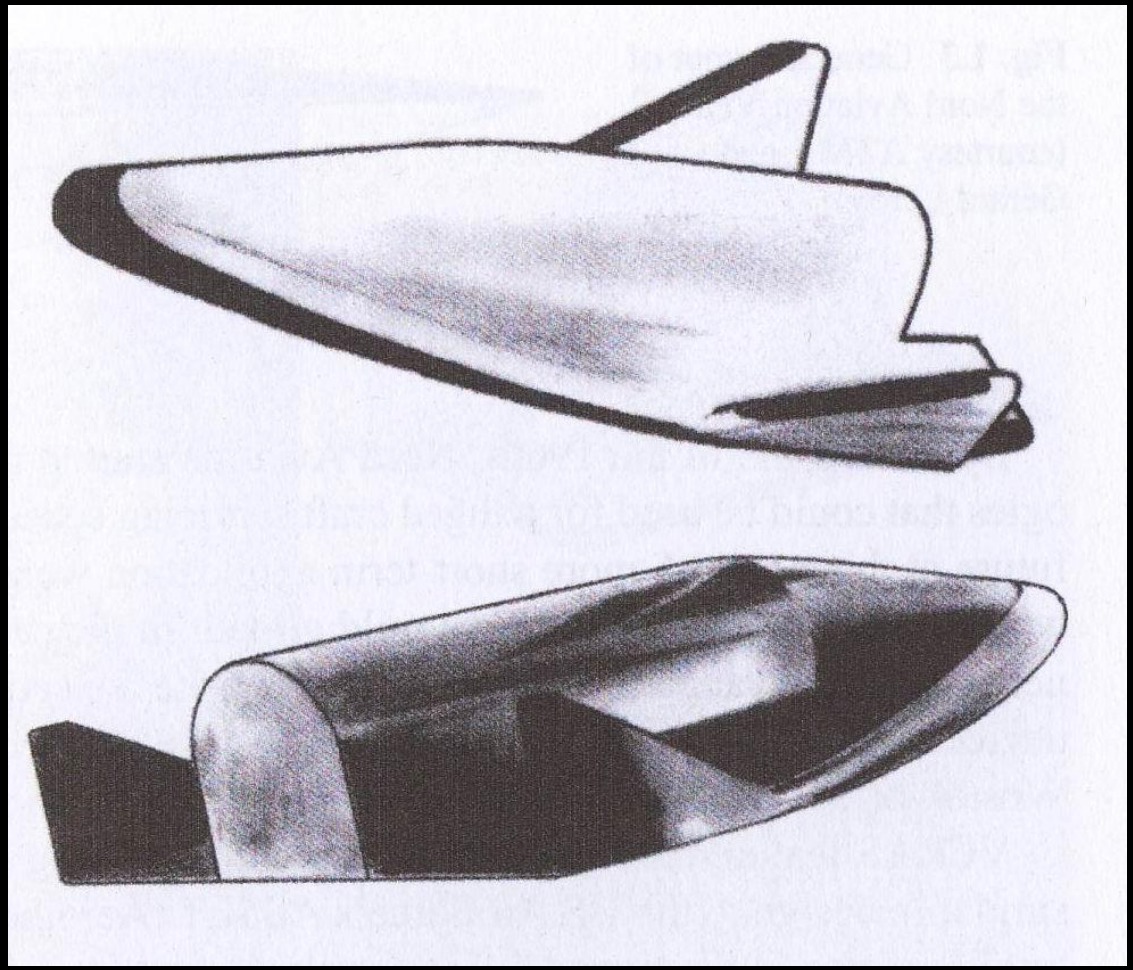
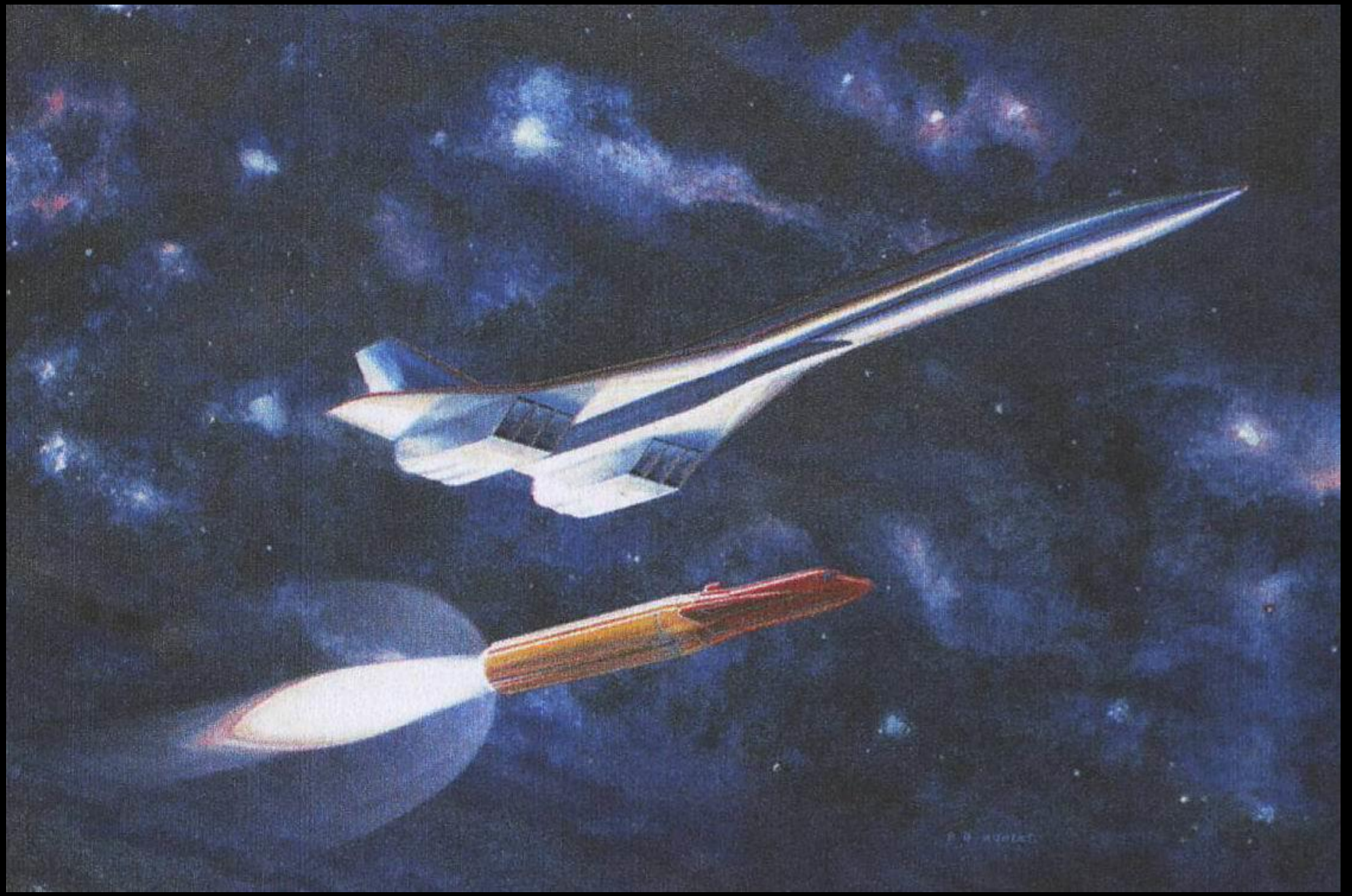


Návratová tělesa (ONERA)

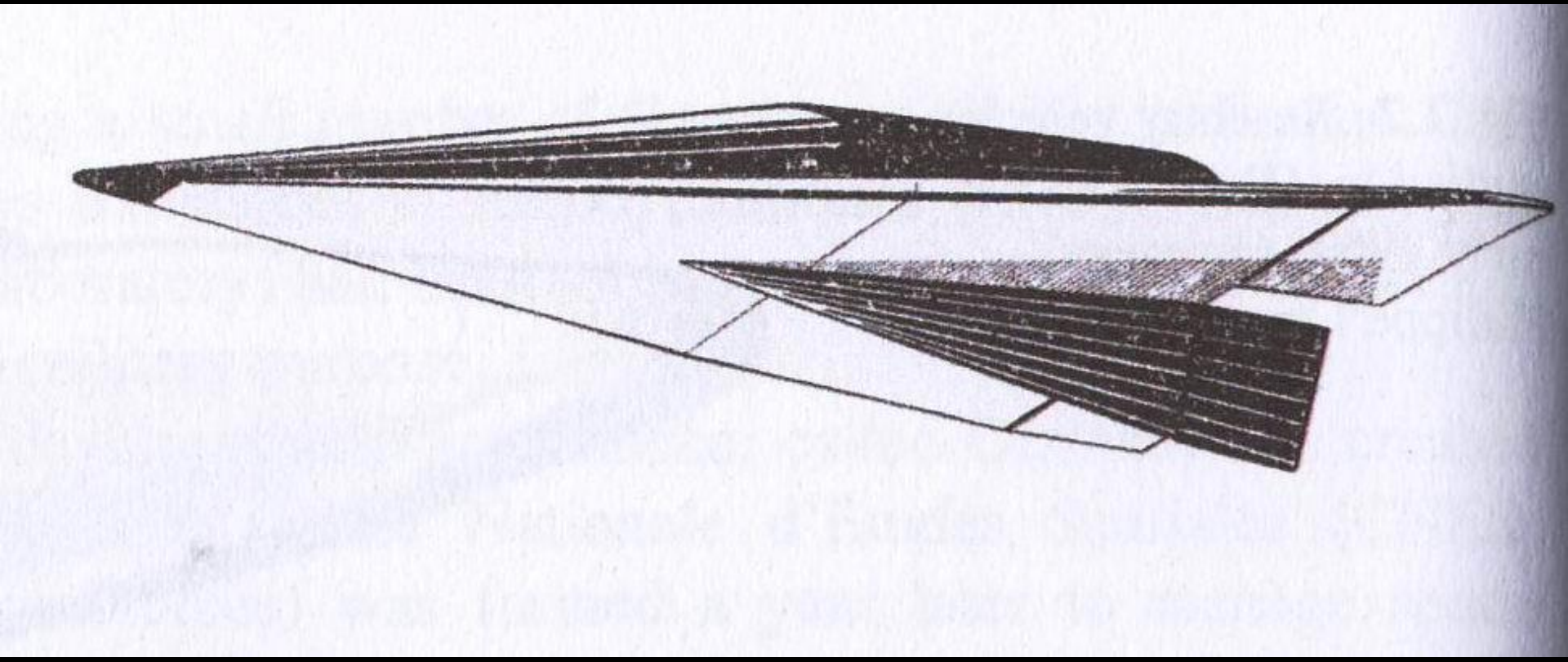


Národní kancelář pro aerokosmické studie a vývoj

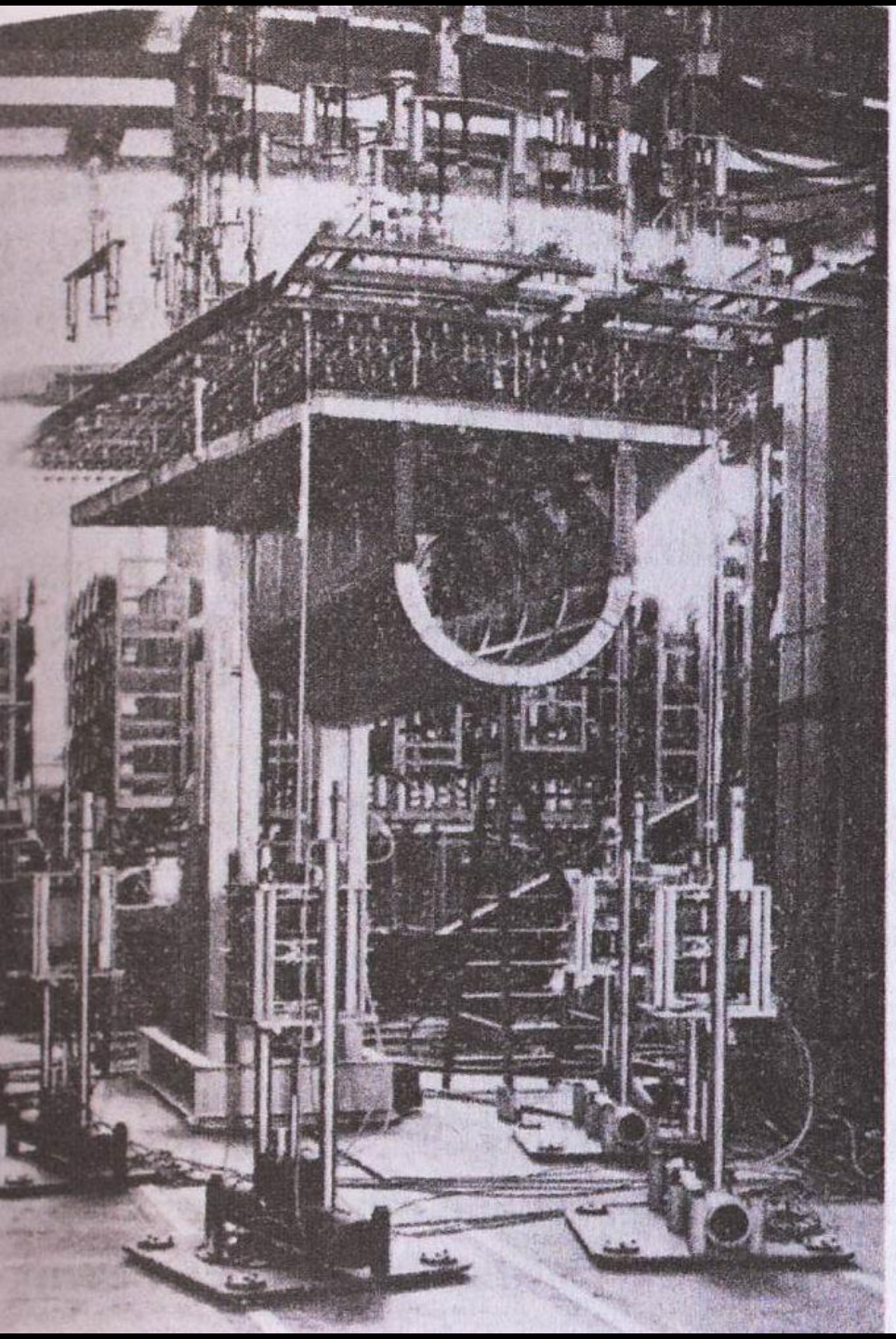
Dassault (1964)

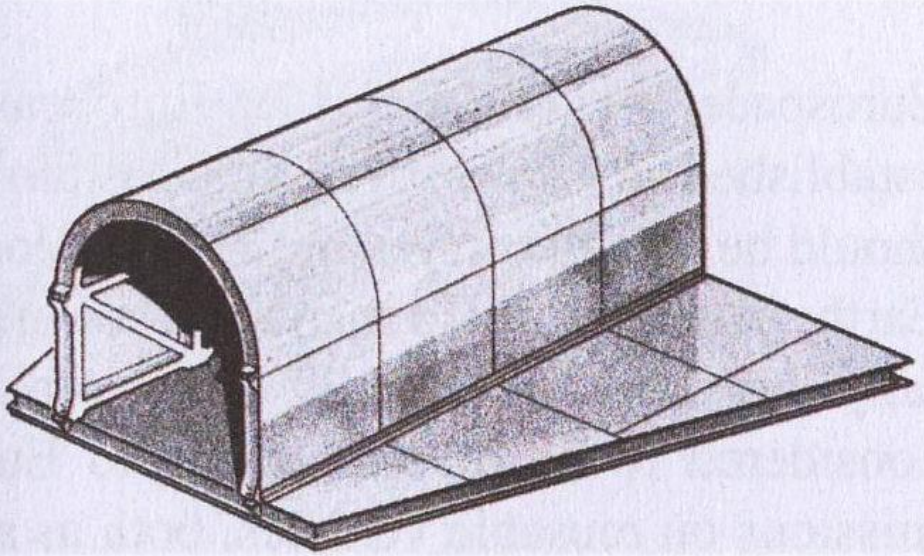


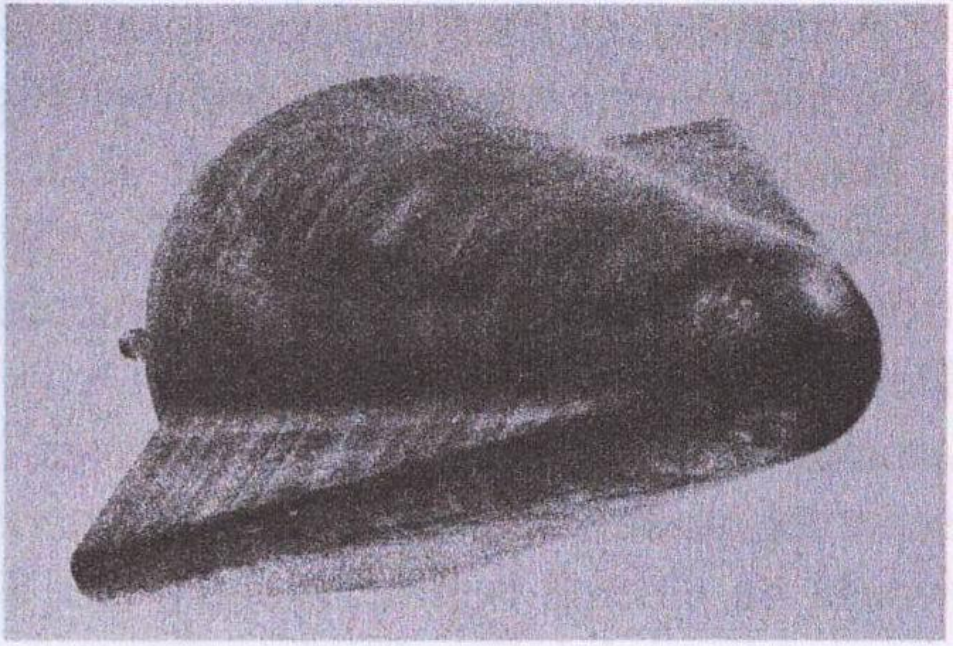
VERAS



Experimentální zařízení pro aerotermodynamický a strukturální vývoj

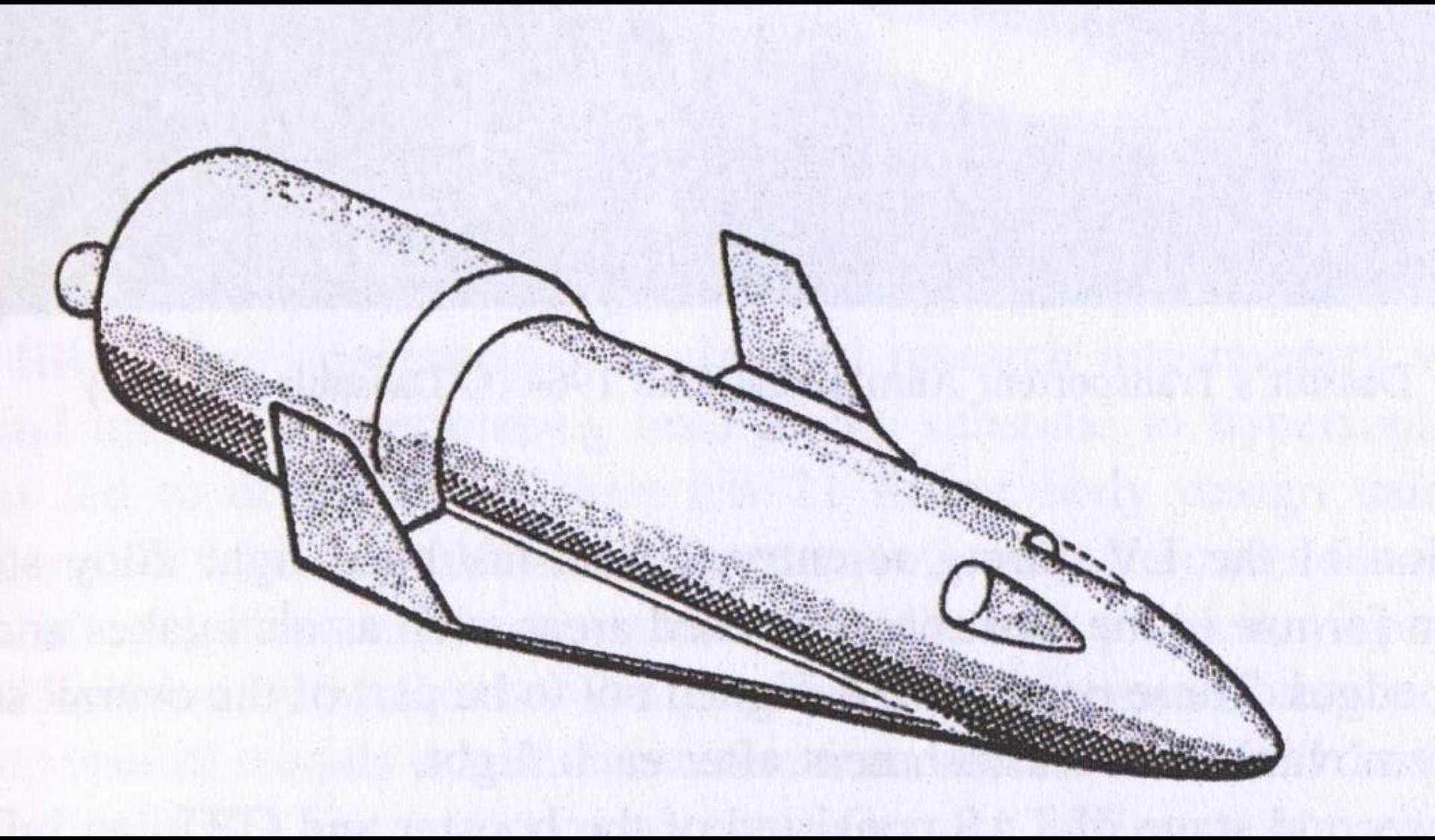




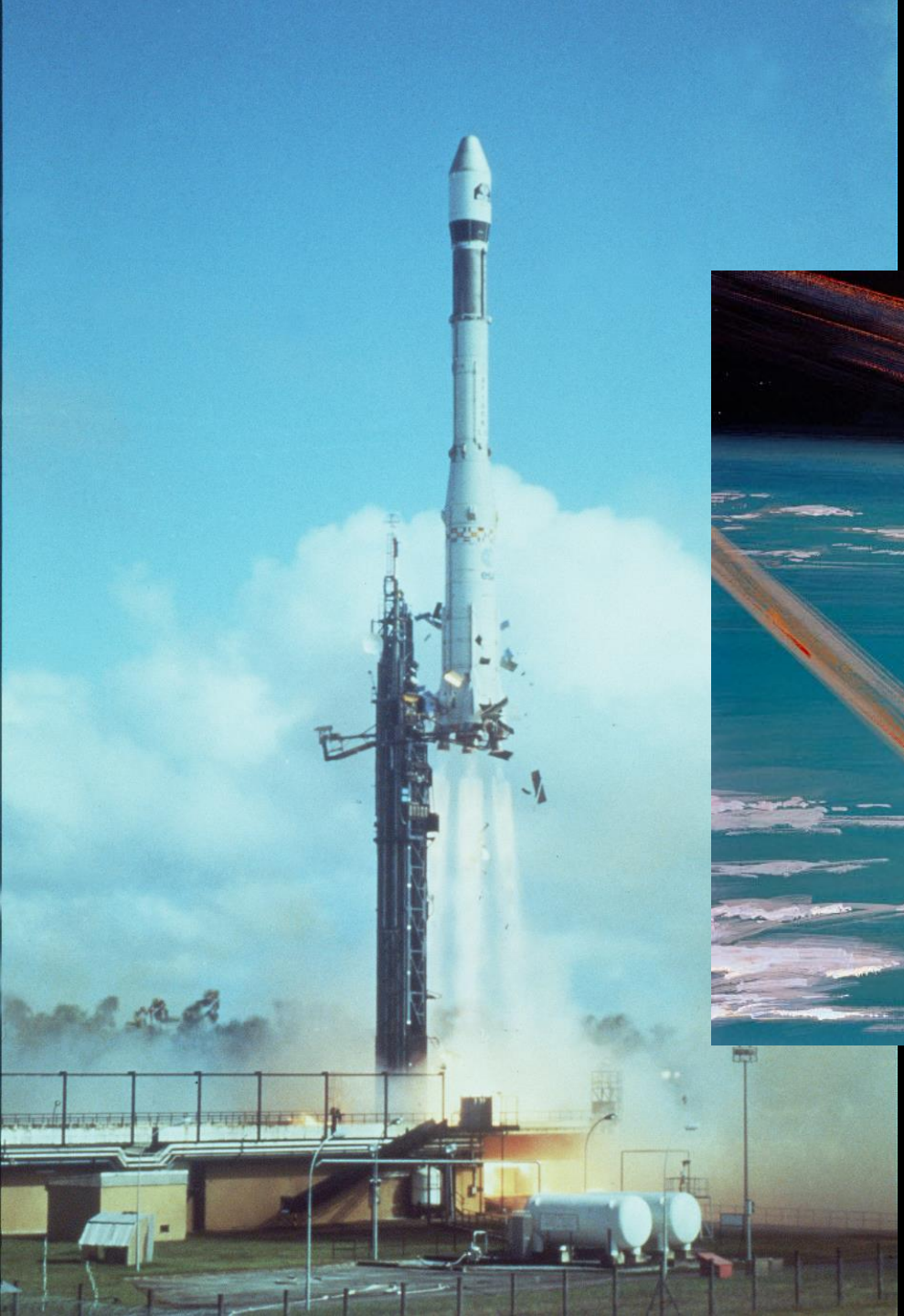


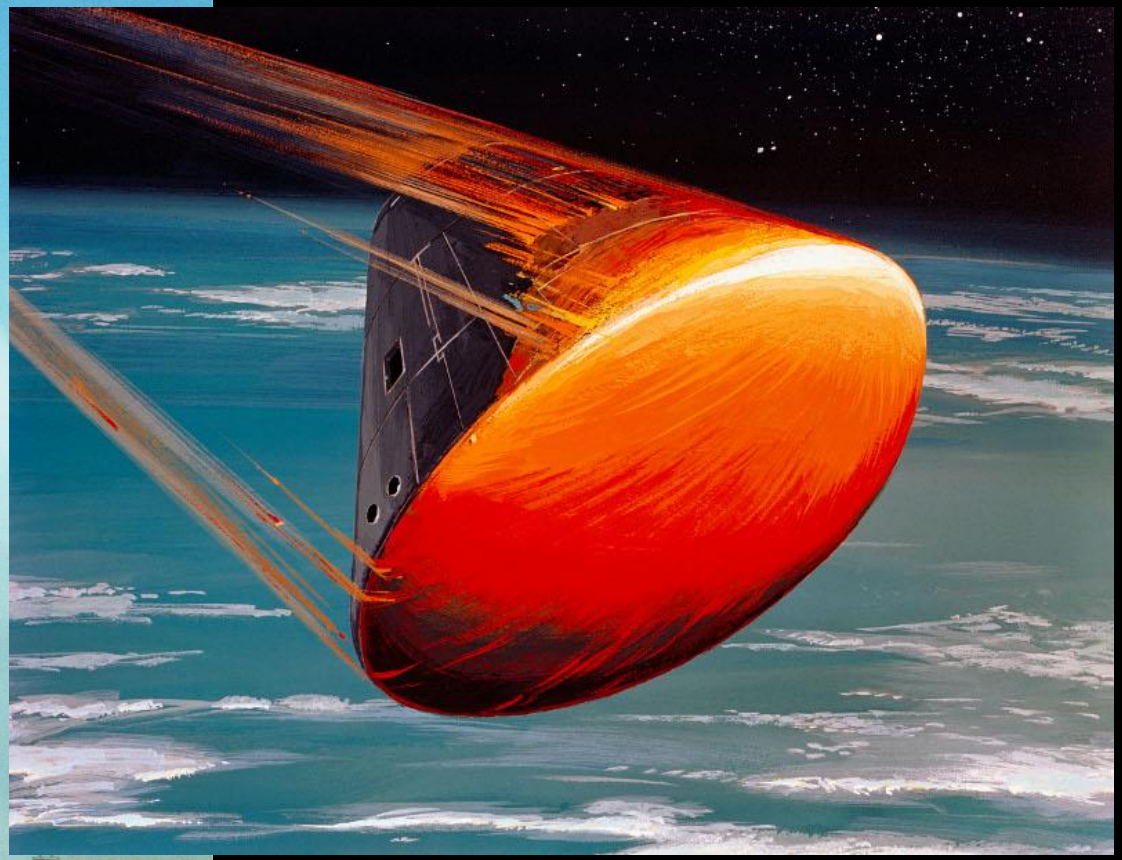
Raketa Emeraude

ELDO (1966)



Ariane (1975)



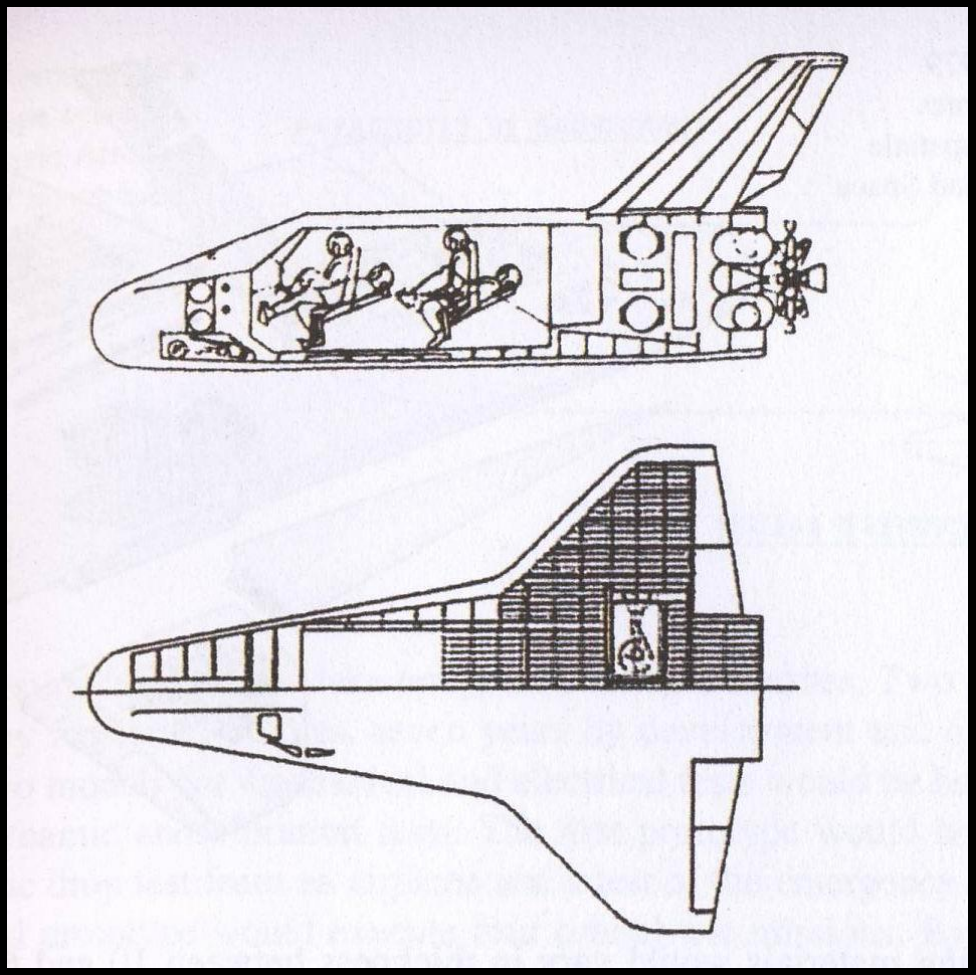


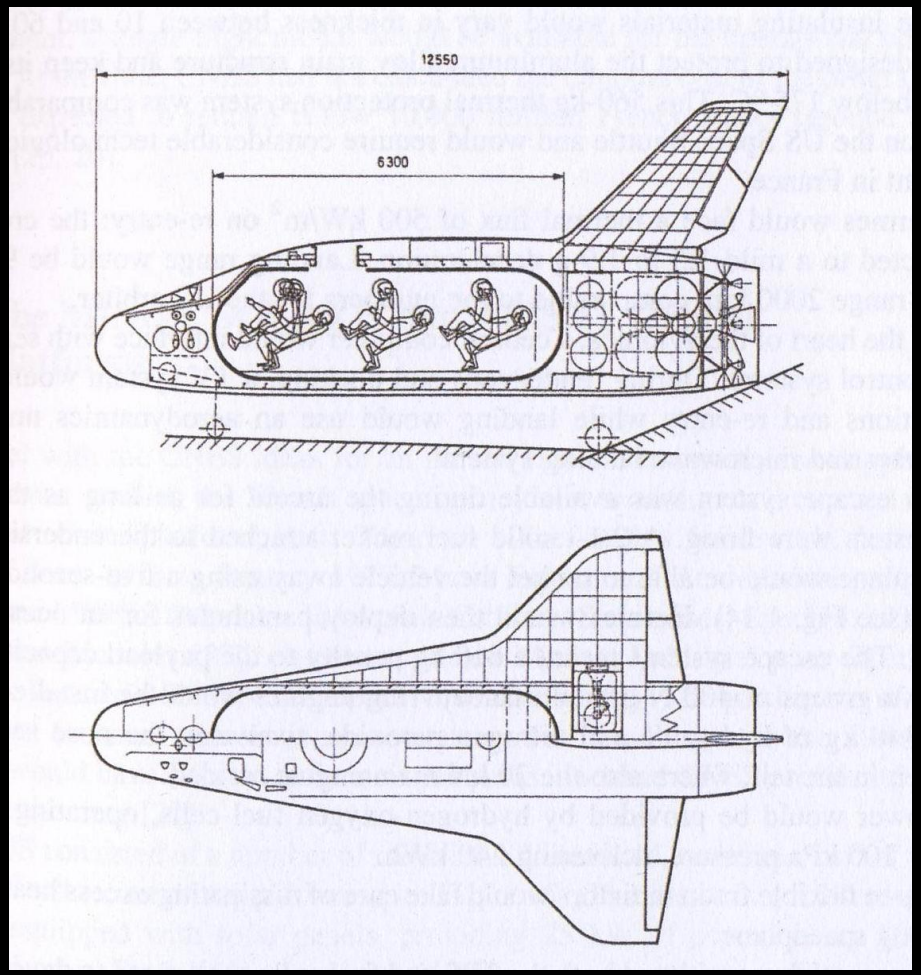
1975

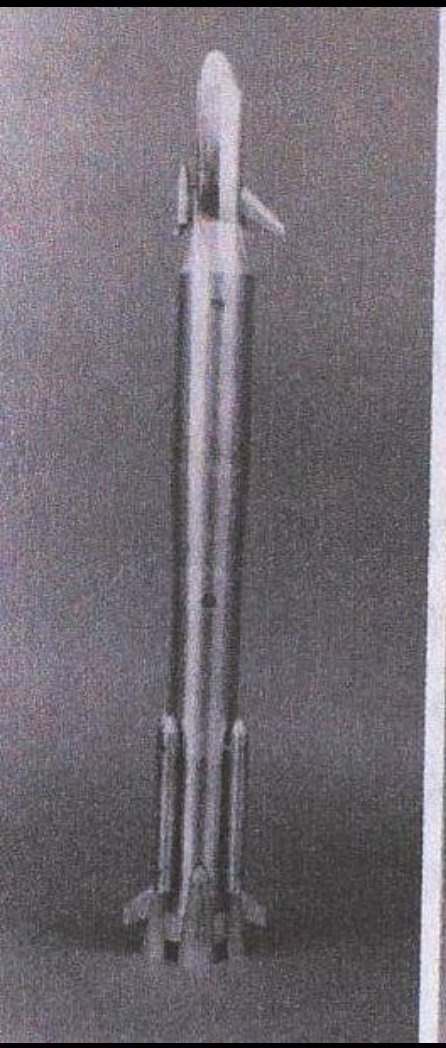
Frédéric d´Allest

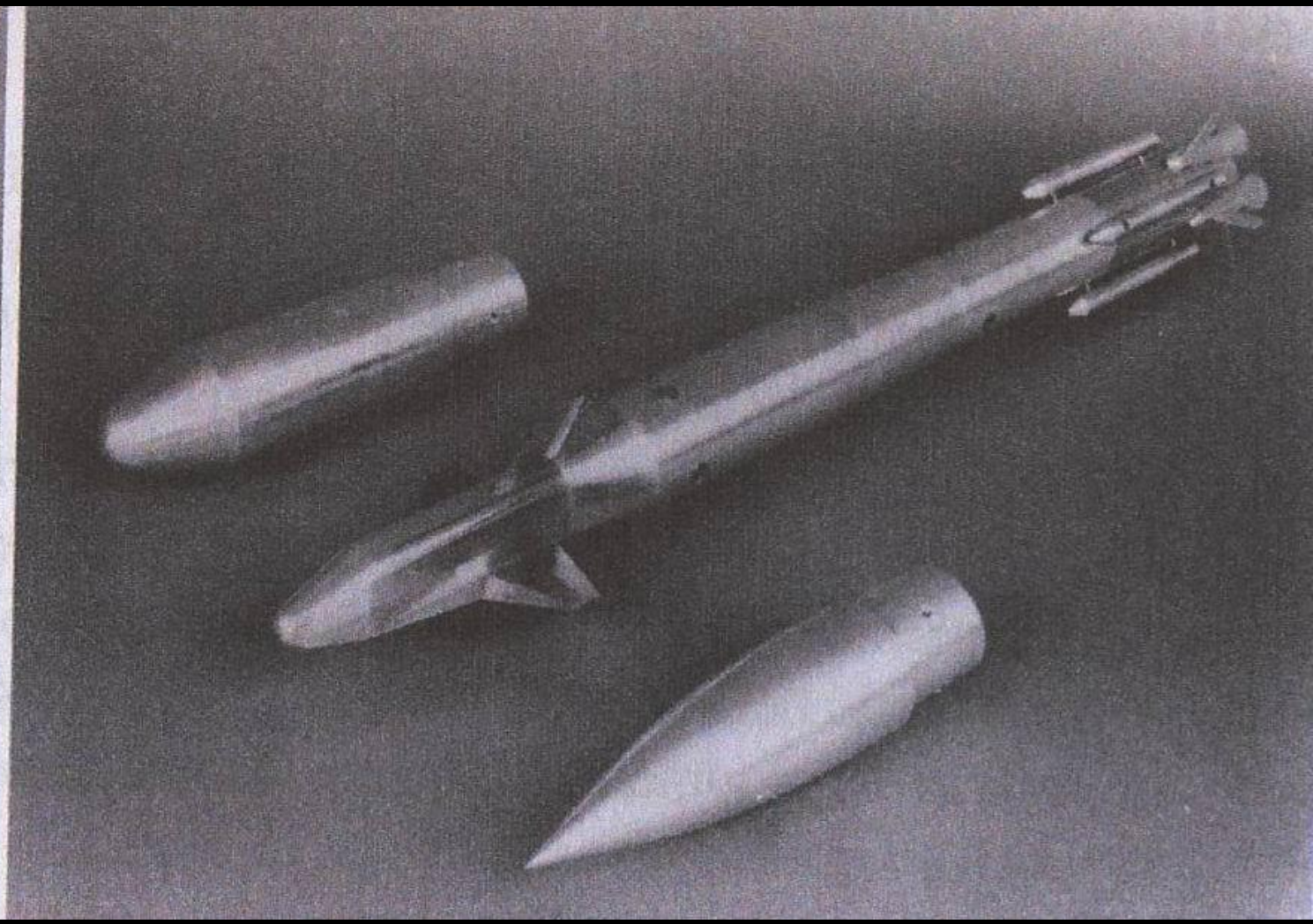
3 kosmonauti, 150 kg zásob

1976





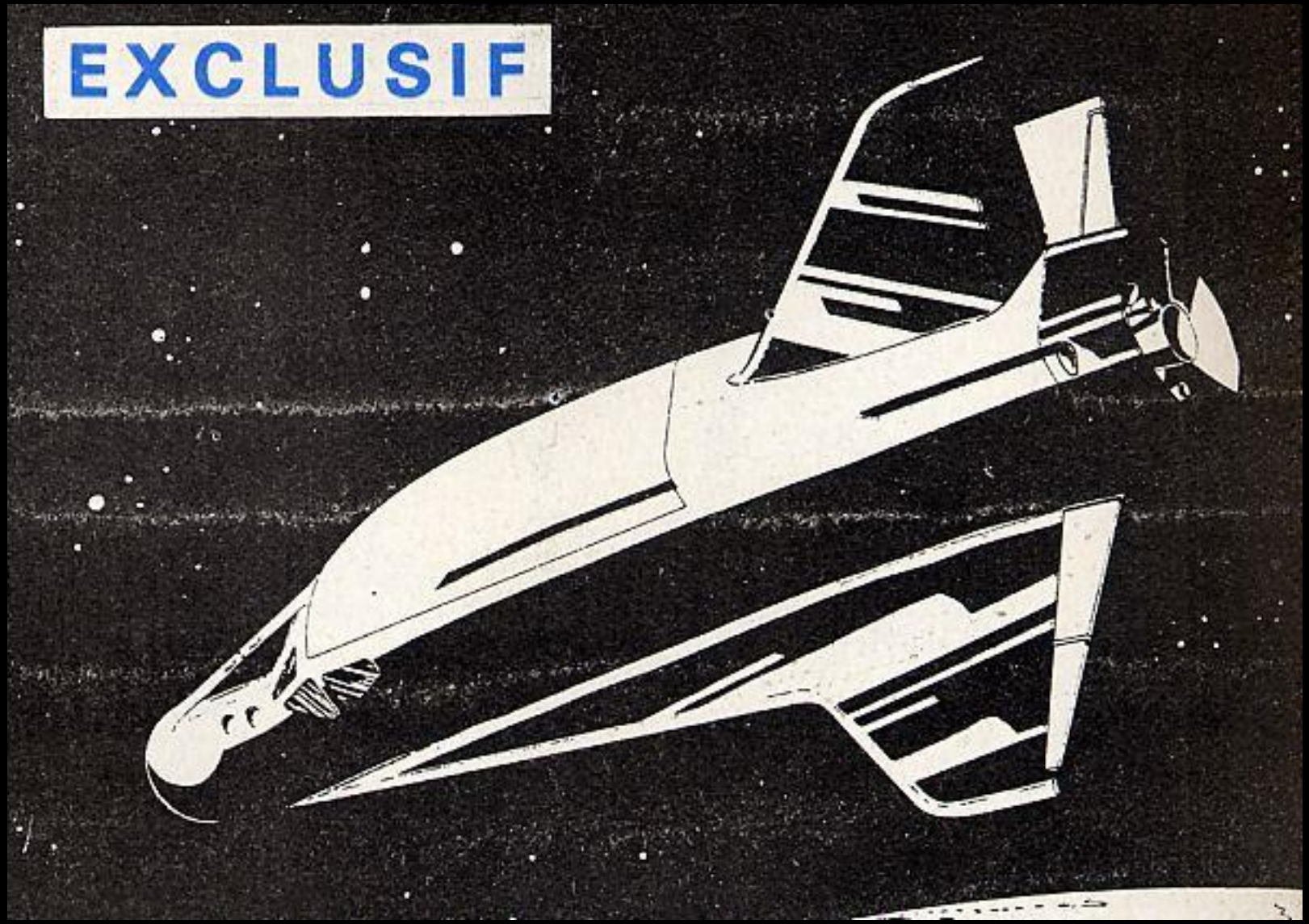




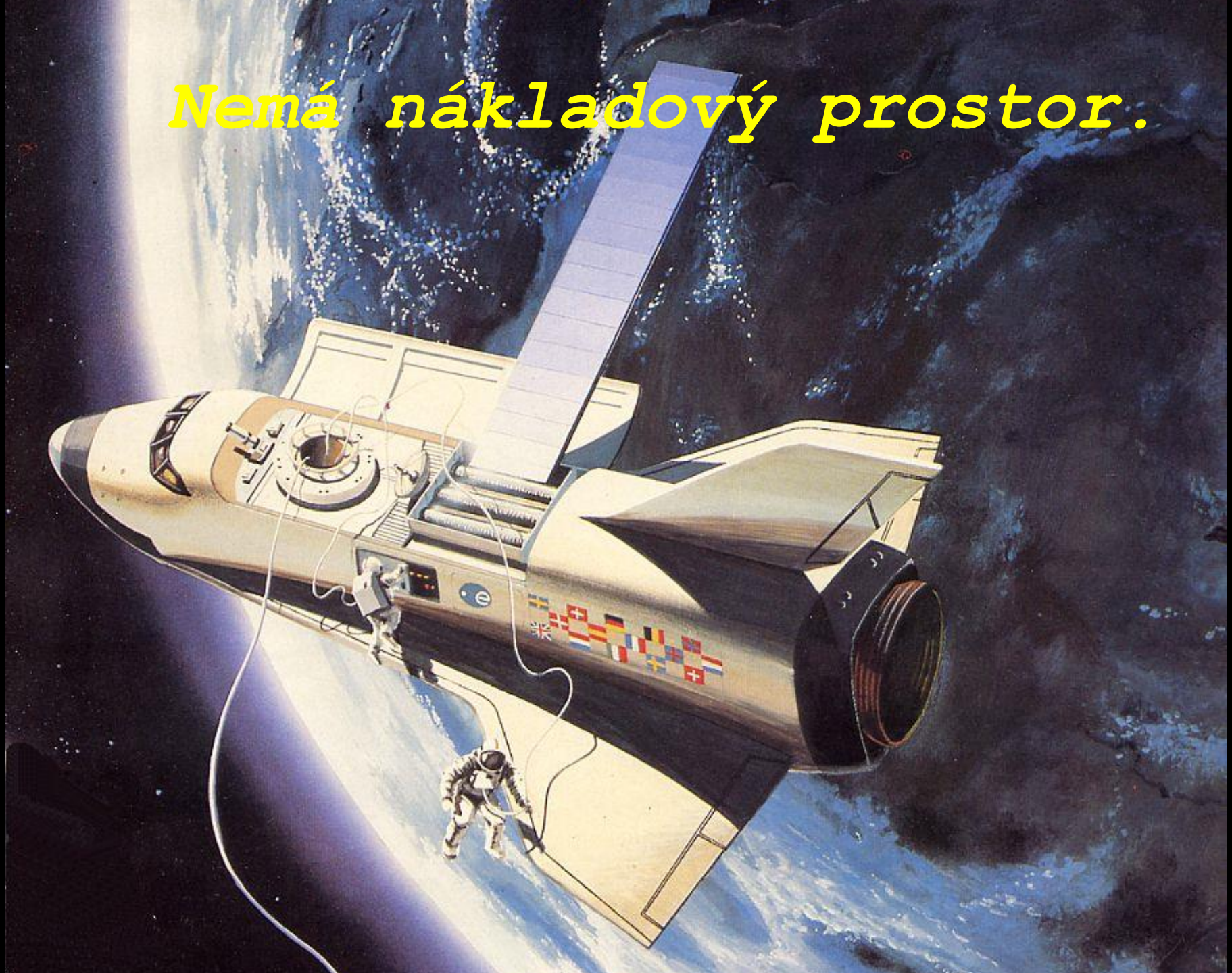
Prosinec 1976

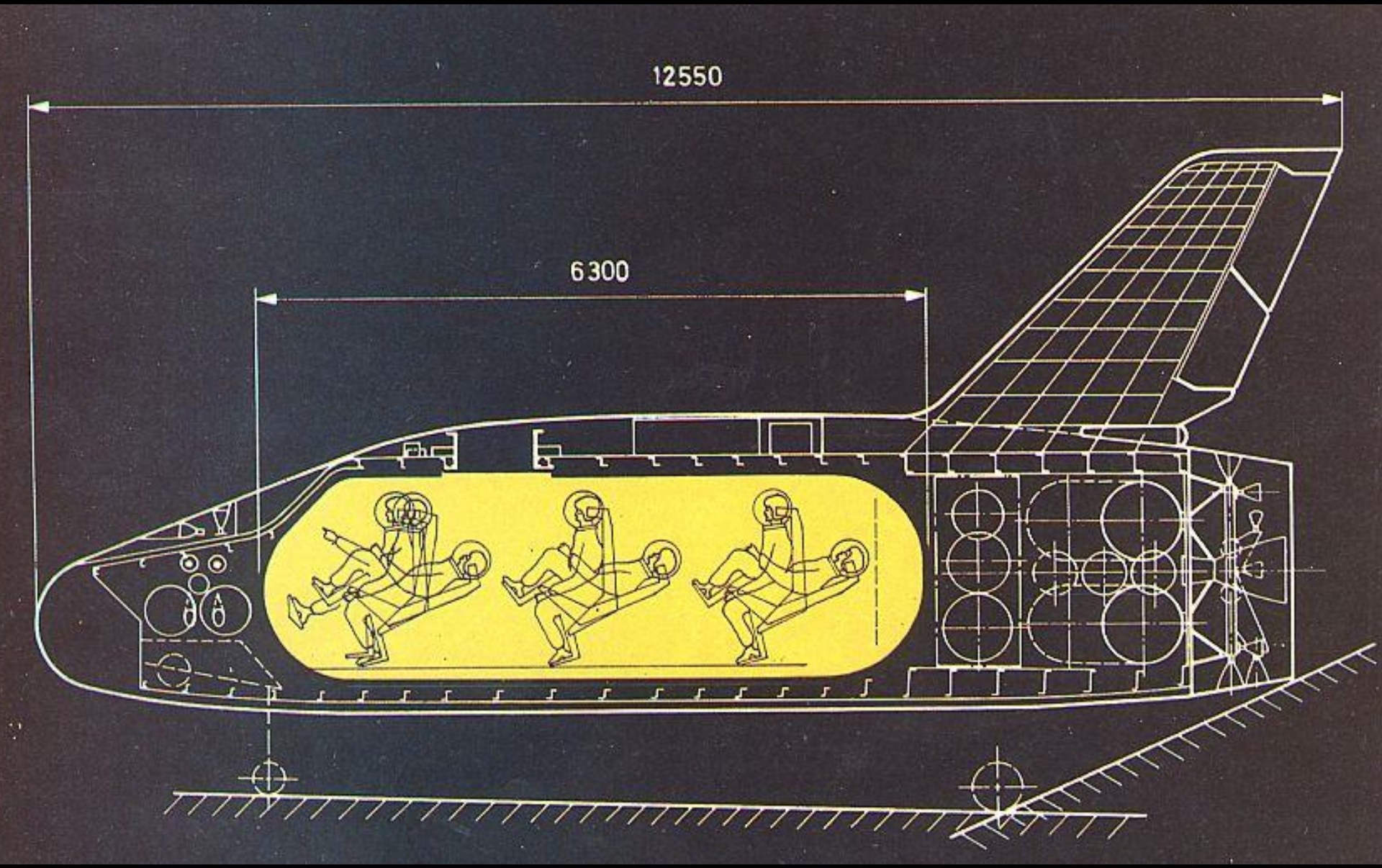
Tepelná ochrana – 560 kg

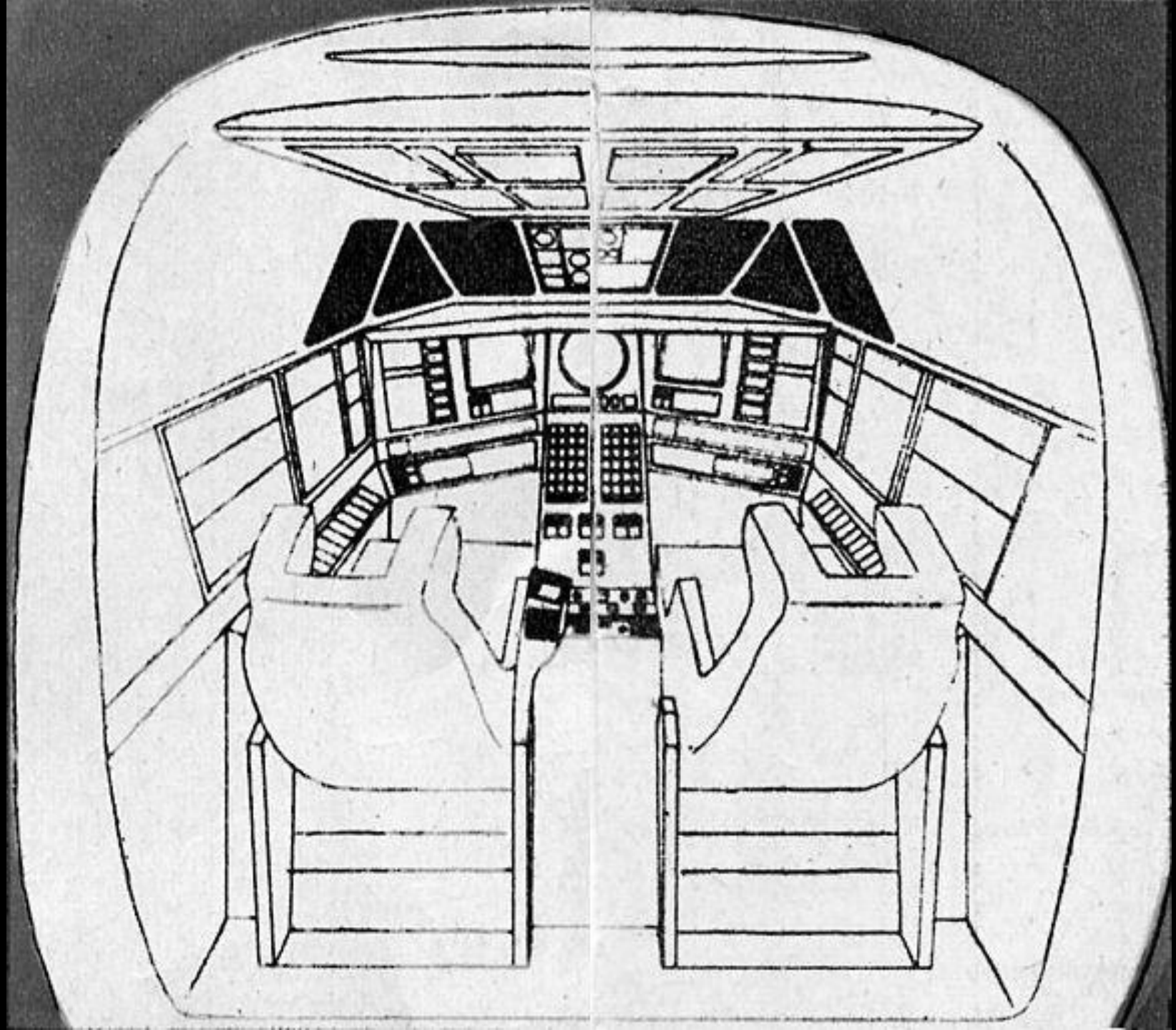
1979



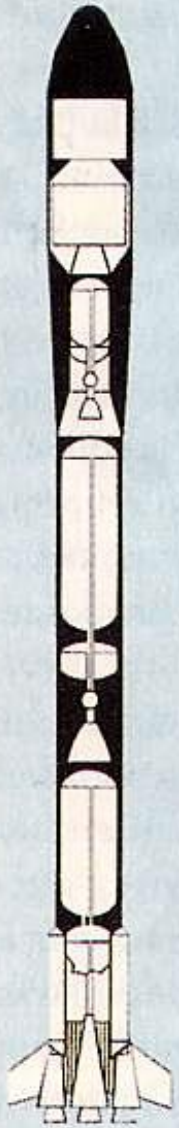
10 t, 12,5 m, 5 kosmonautů, 1500 kg nákladu


Nemá nákladový prostor.

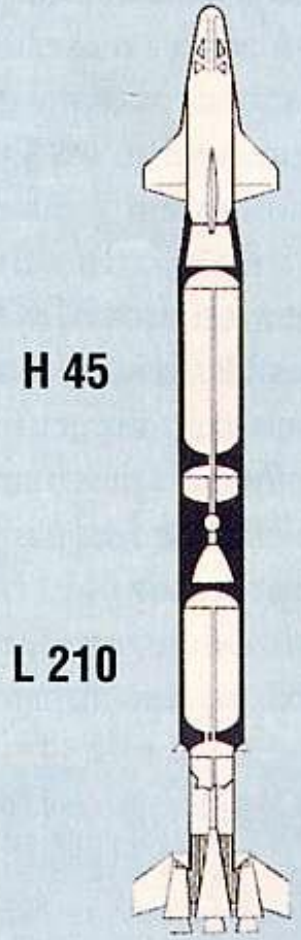

12550
6300



LES CONCEPTS INITIAUX
(INITIAL CONCEPTS)

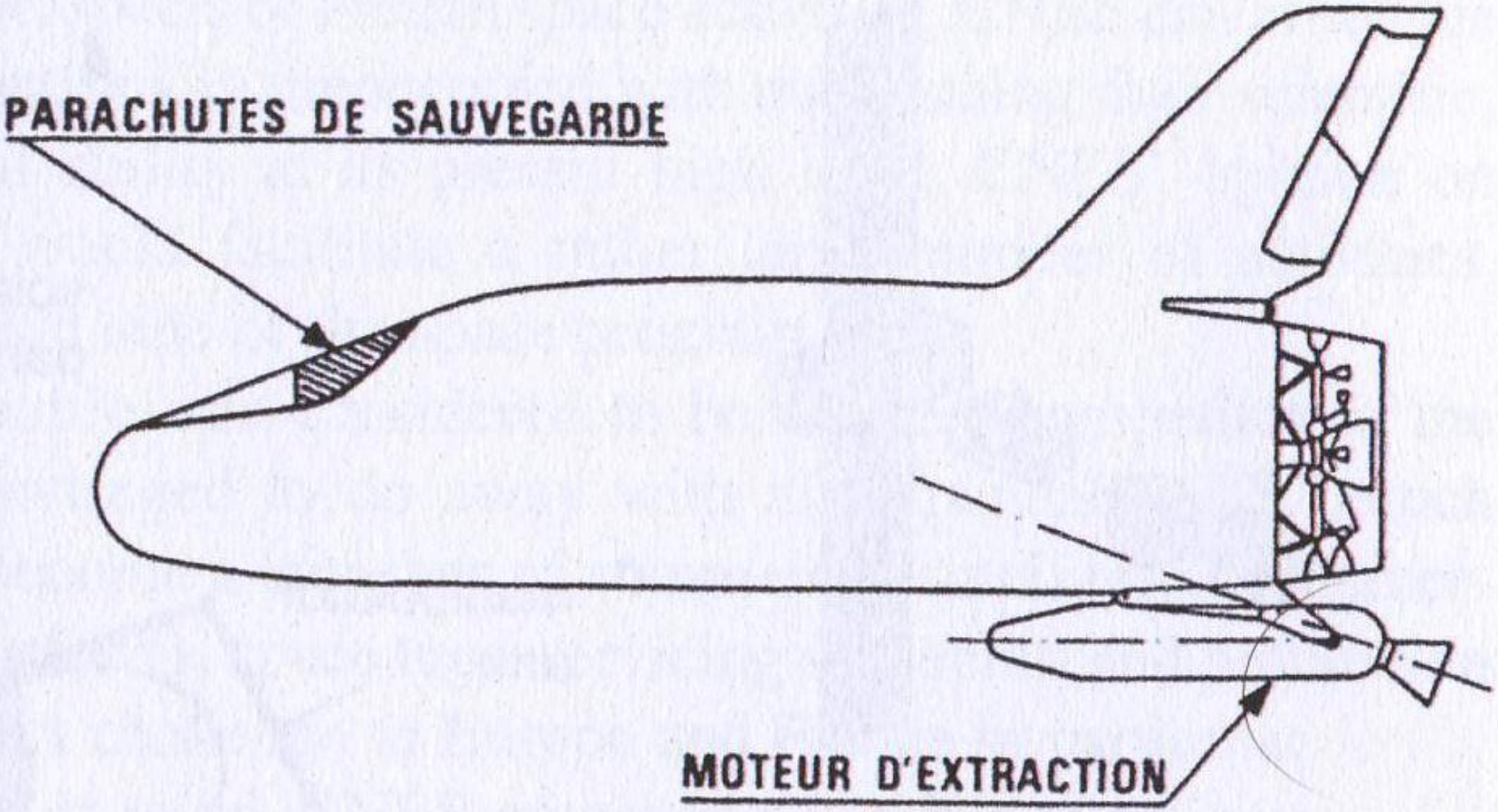


ARIANE 5 : triétage, lancement double. *(3-stage, dual launch)*

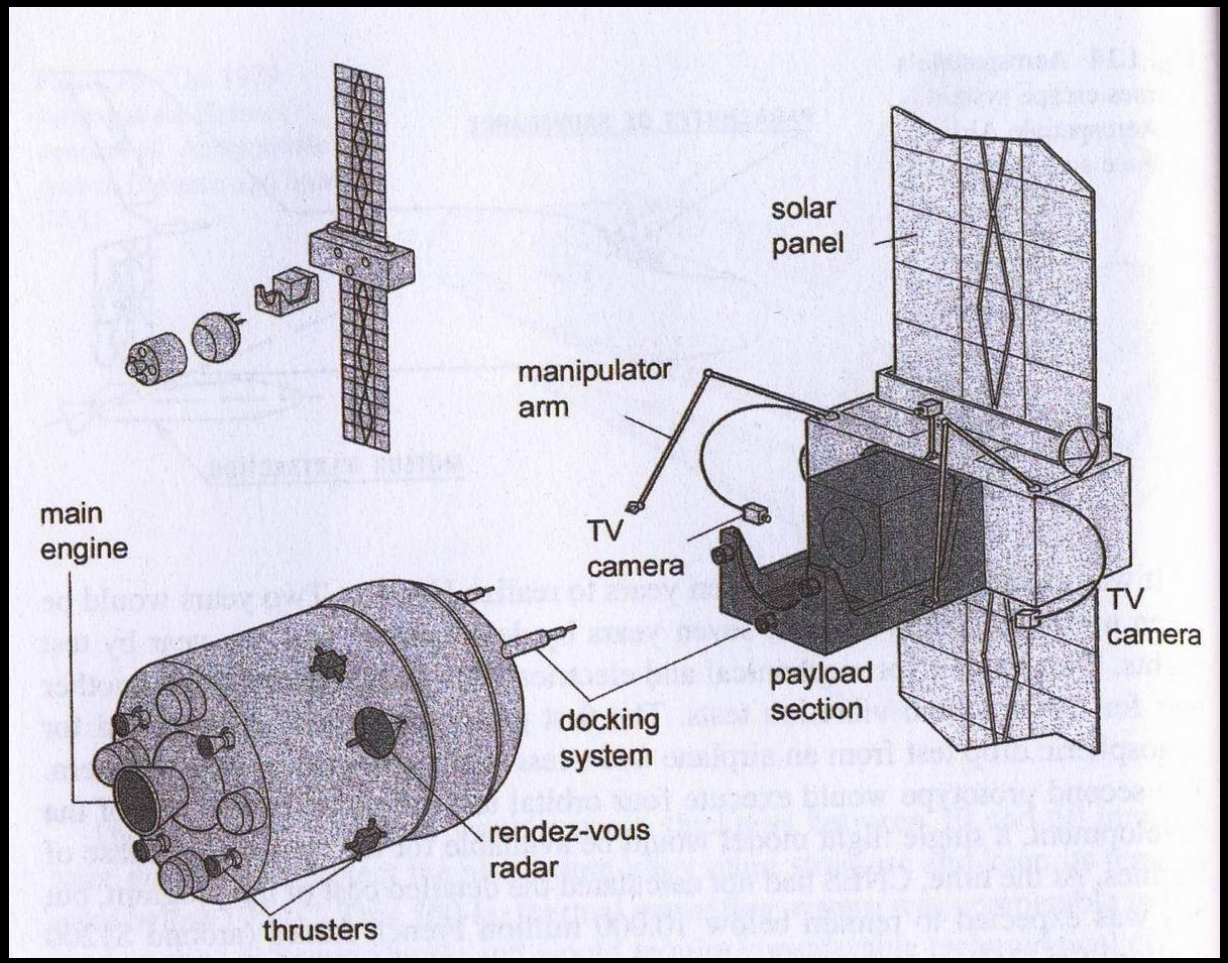


ARIANE 5 : biétage, HERMES vol habité. *(2-stage, Hermes manned flight)*

1980

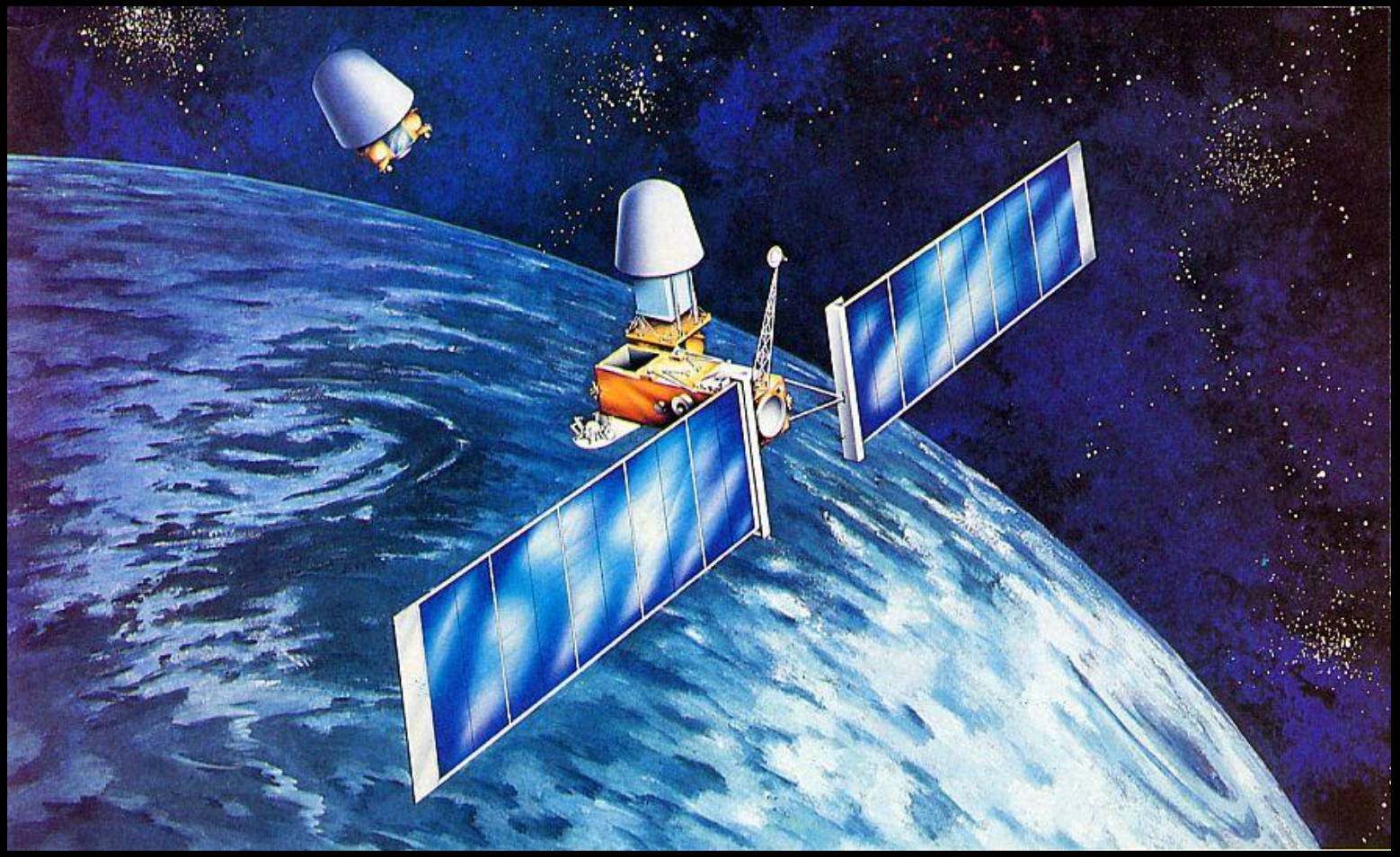


MINOS

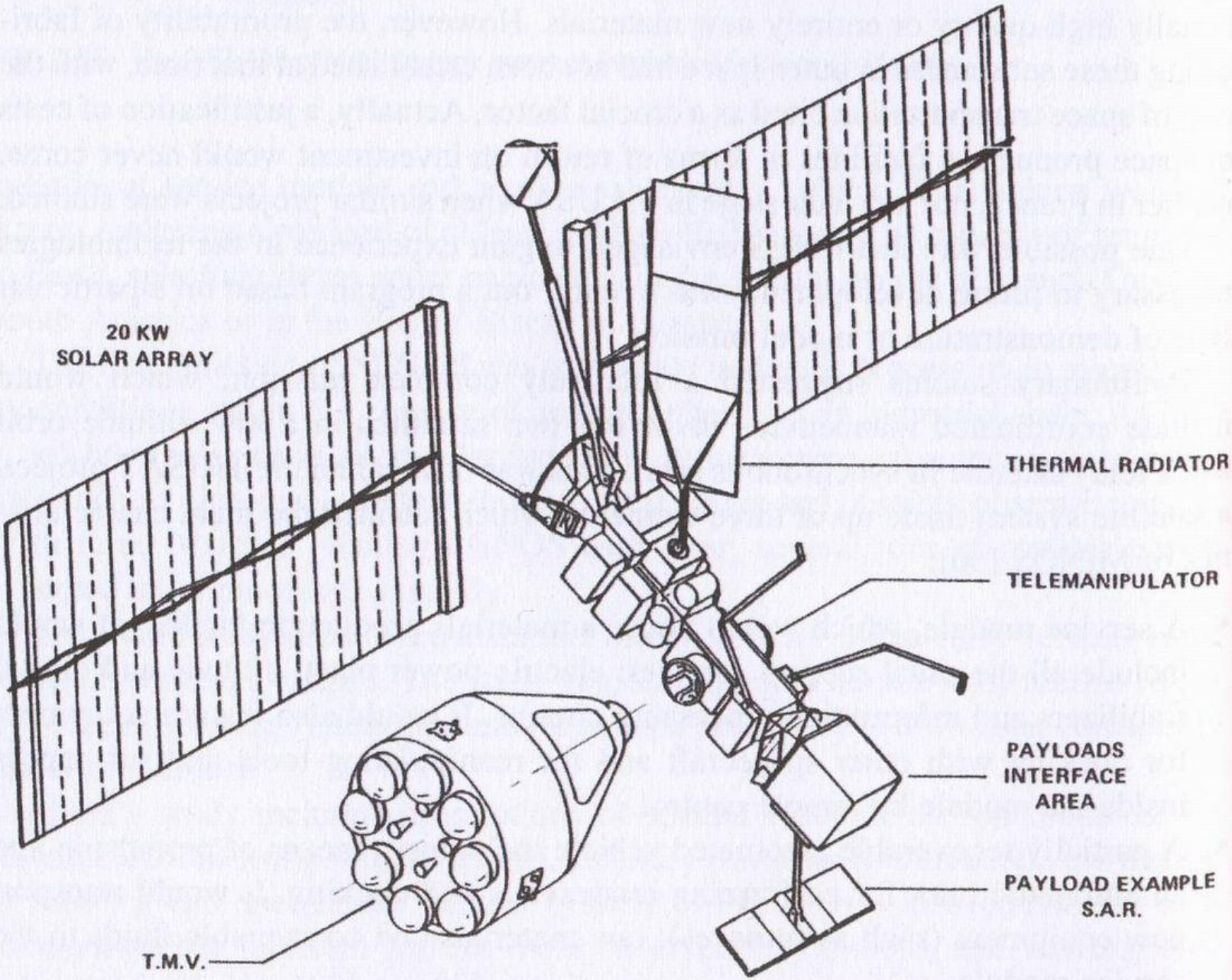


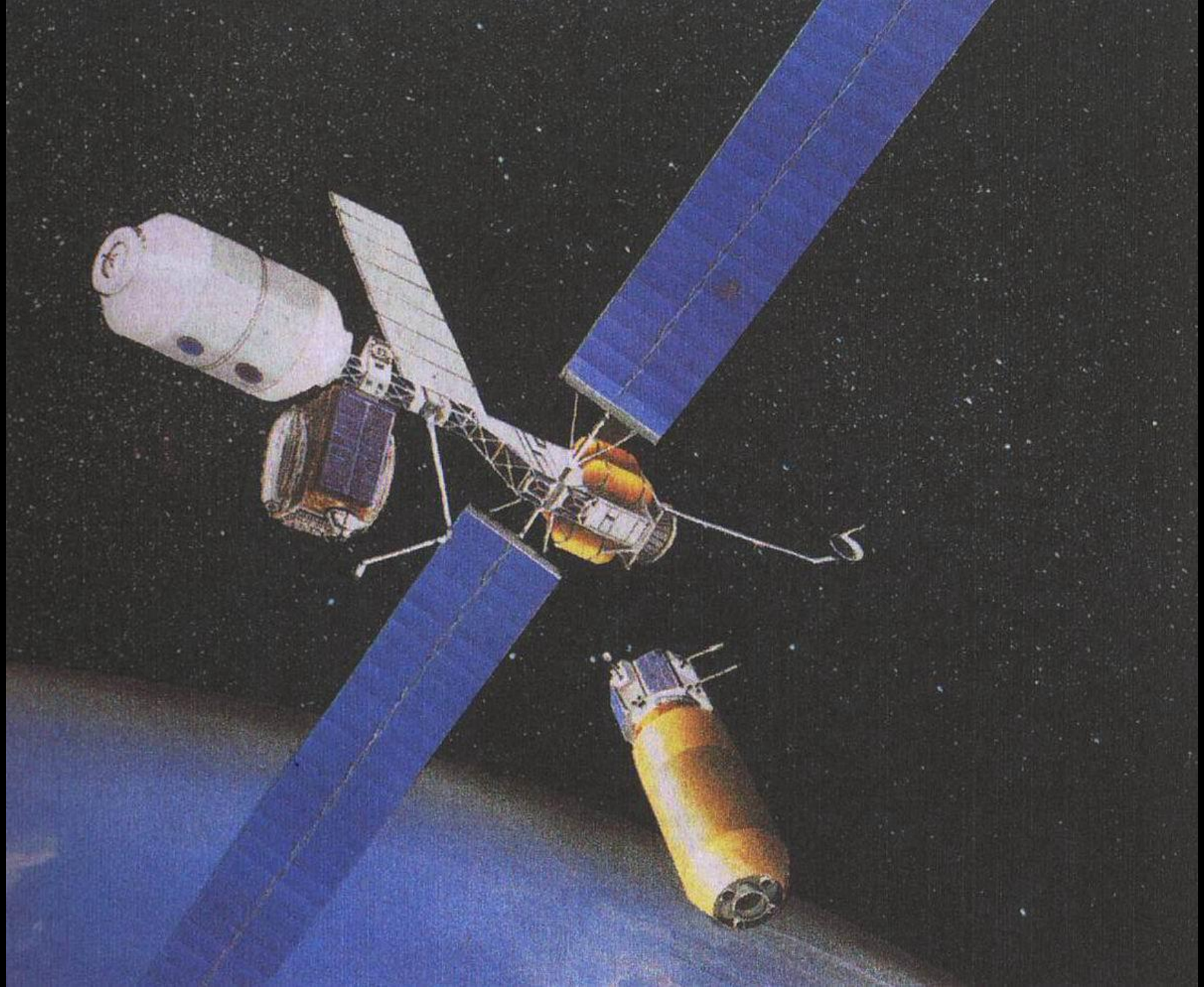
Specializované průmyslové orbitální moduly

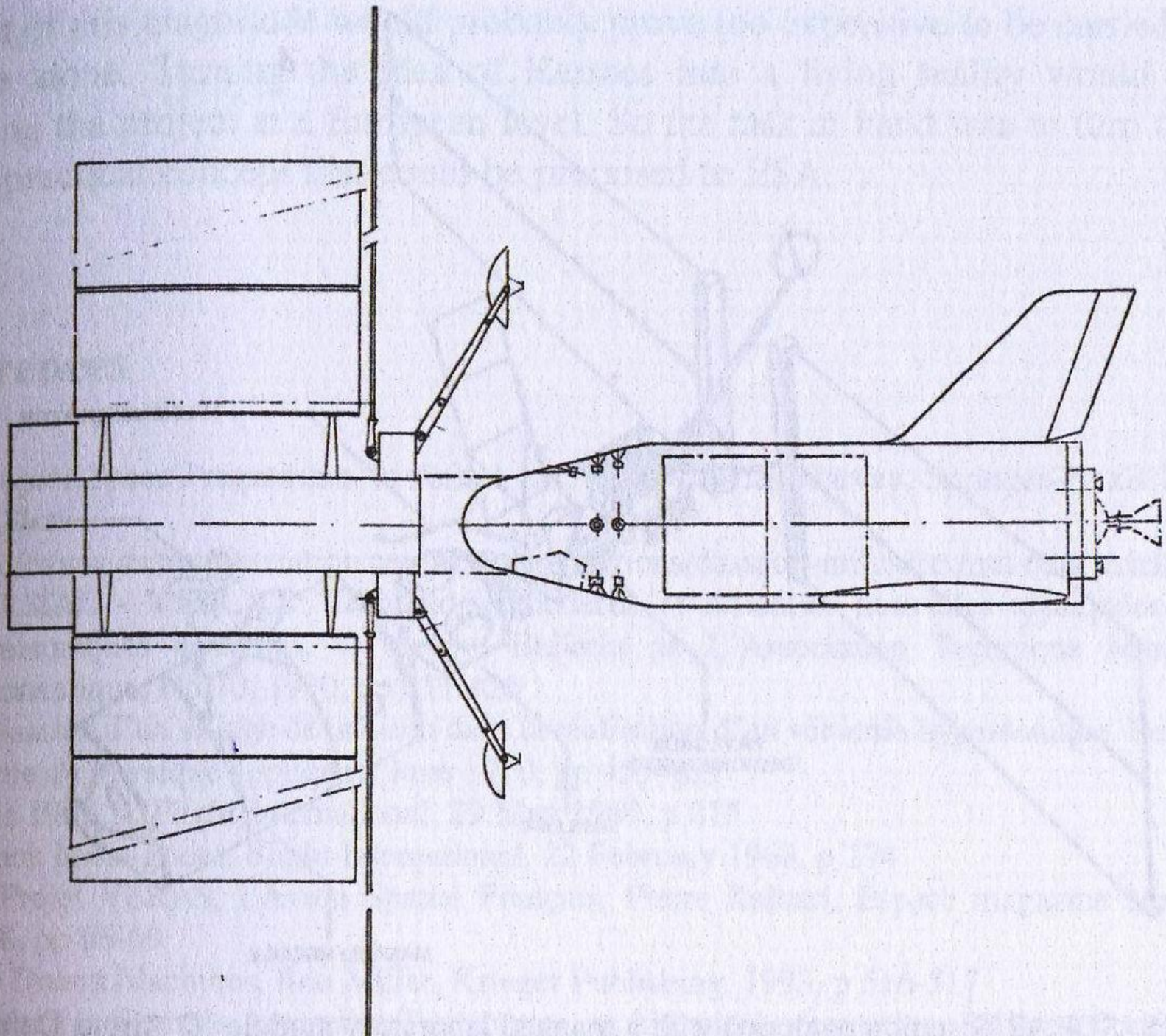
SOLARIS

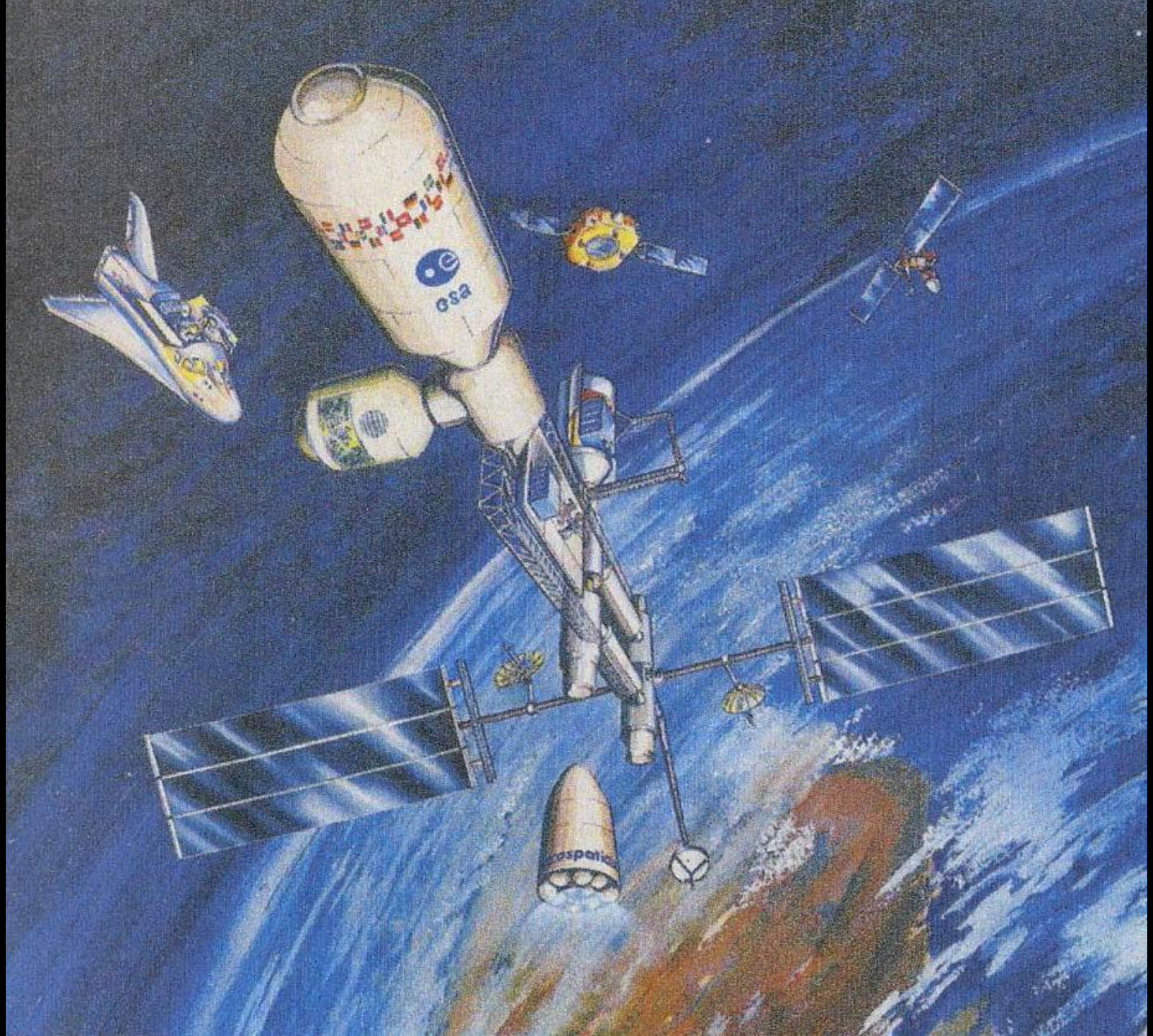


Automatická orbitální stanice pro setkávání a operace

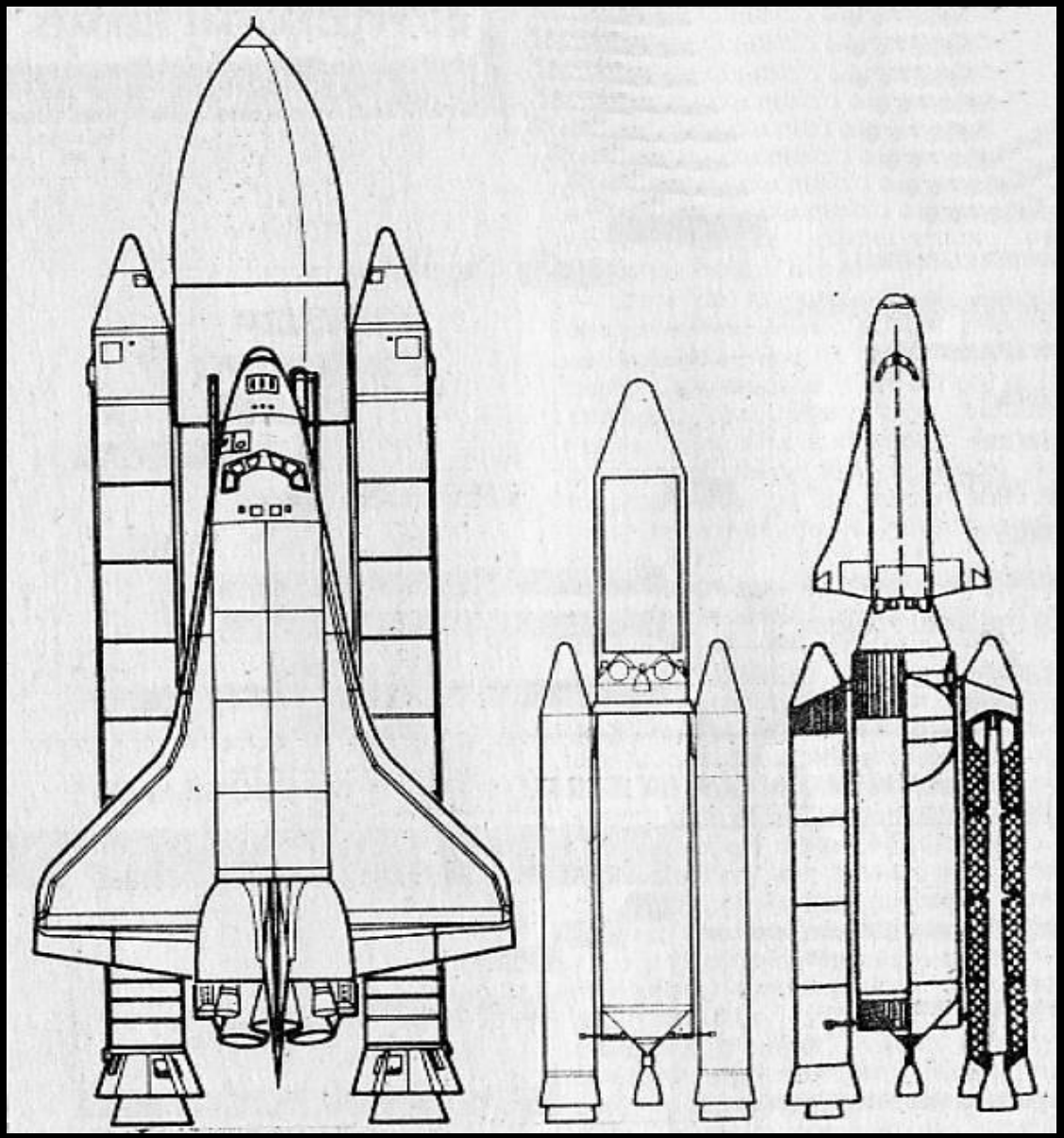

20 KW
SOLAR ARRAY
THERMAL RADIATOR
TELEMANIPULATOR
PAYLOADS
INTERFACE
AREA
PAYLOAD EXAMPLE
S.A.R.
T.M.V.

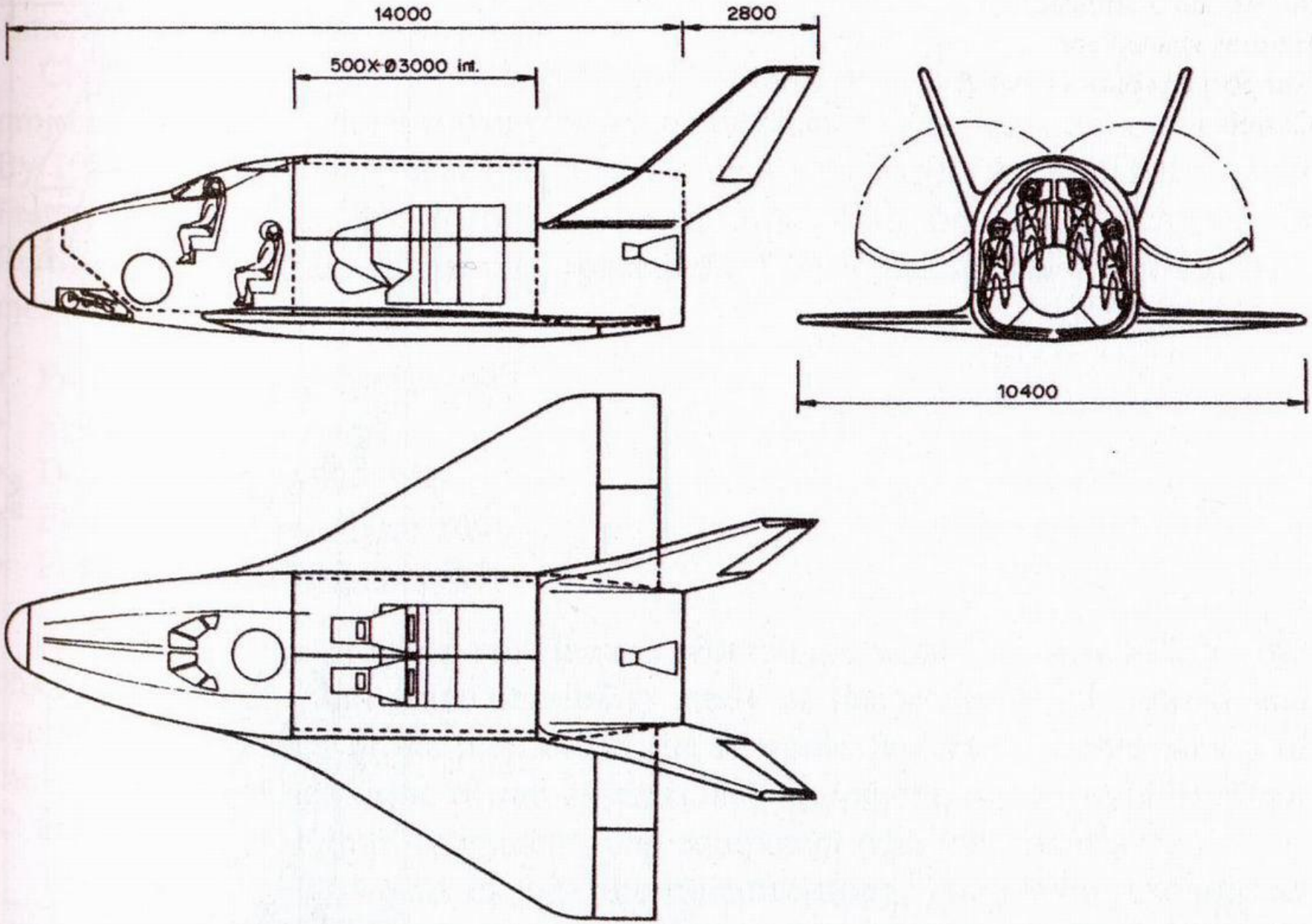





esa

1983

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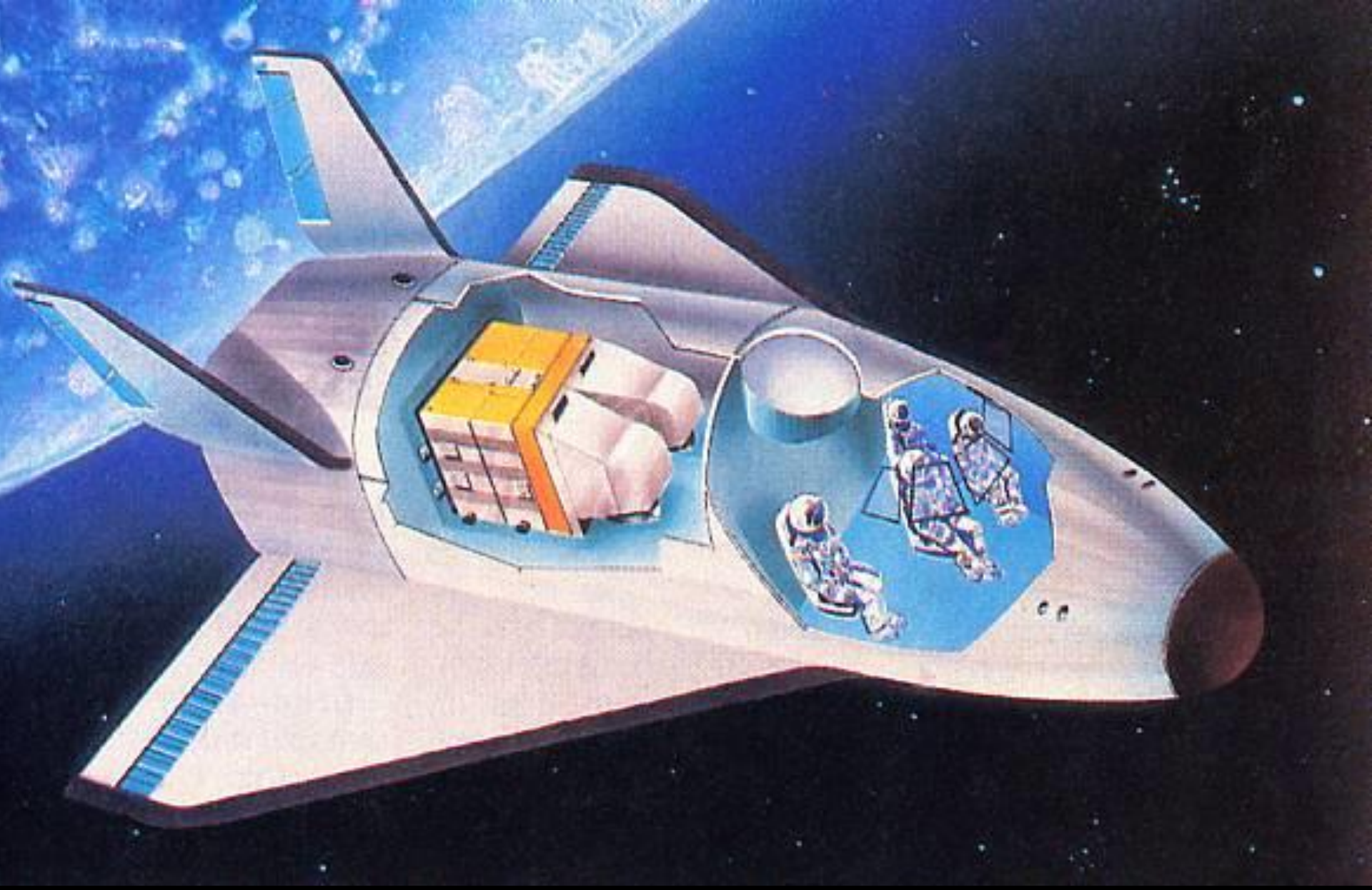
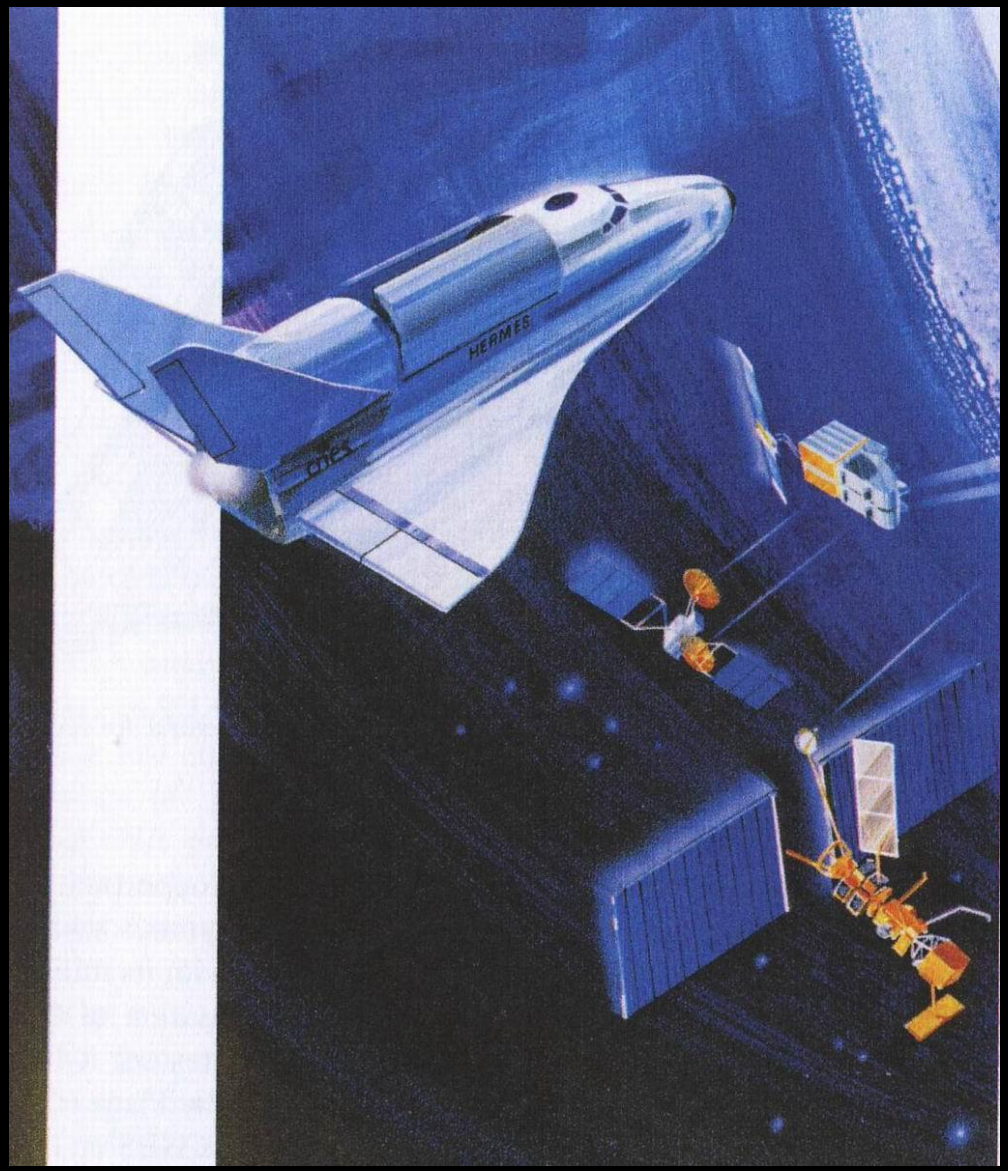
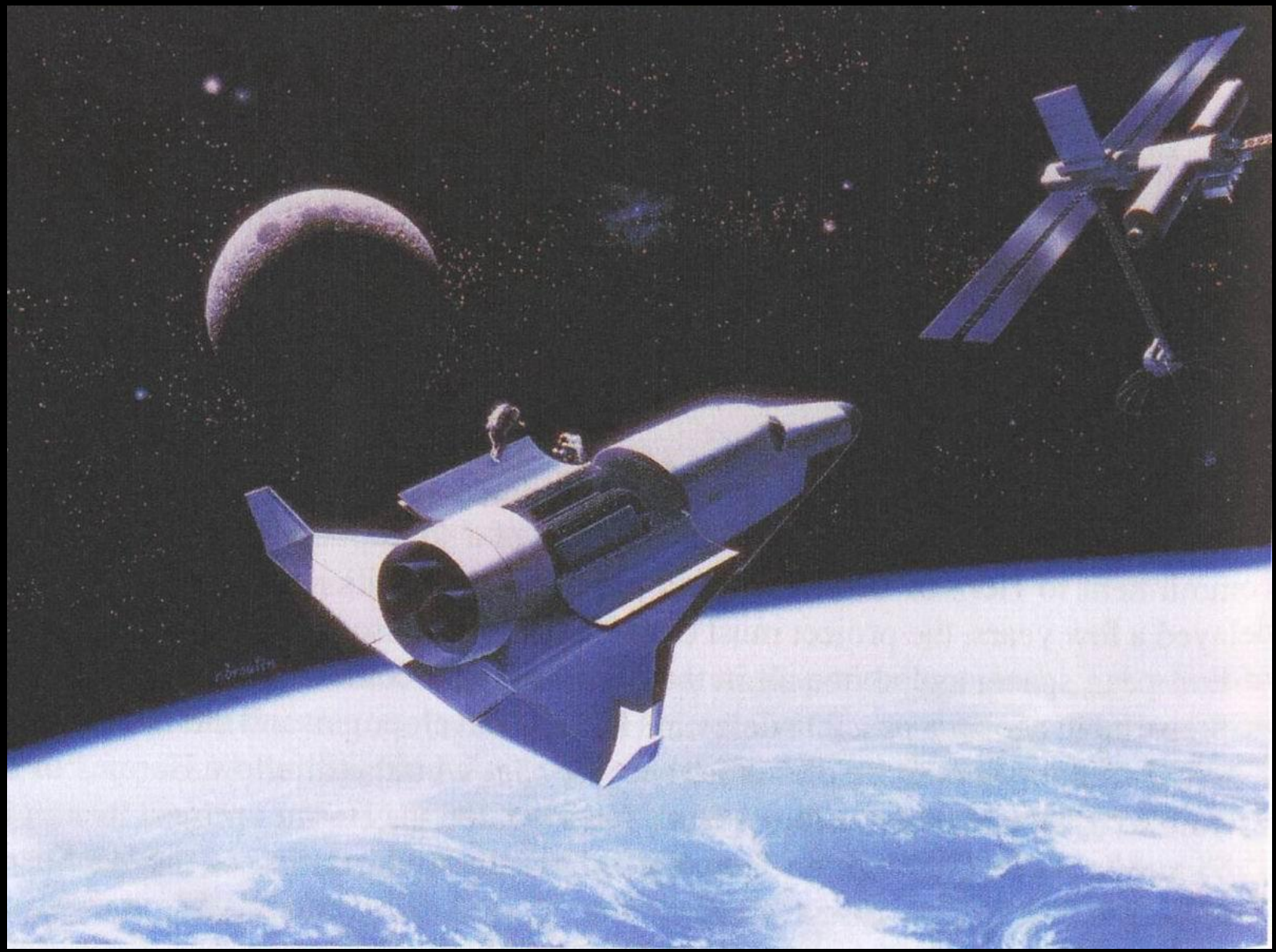


5 m délka, průměr 4 m, 4 kosmonauti

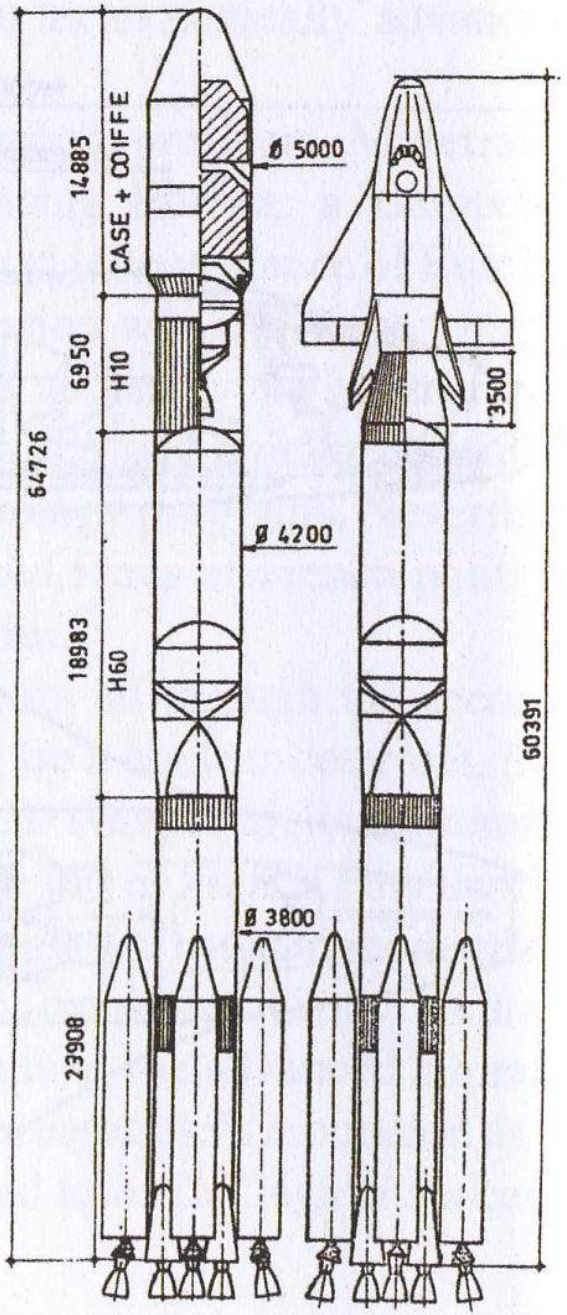


Spolehlivost 98 procent, ztráta životů 1:1000

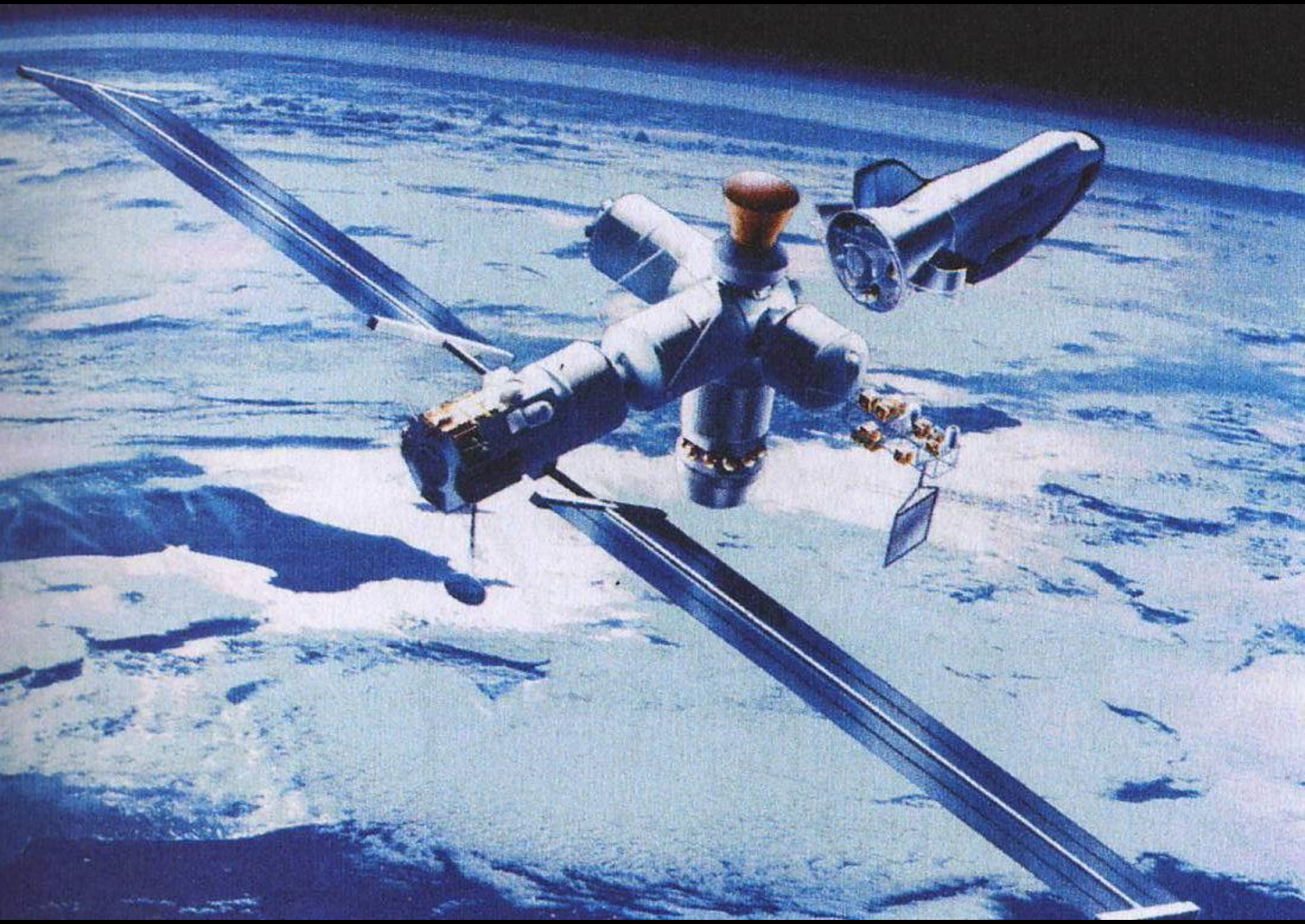


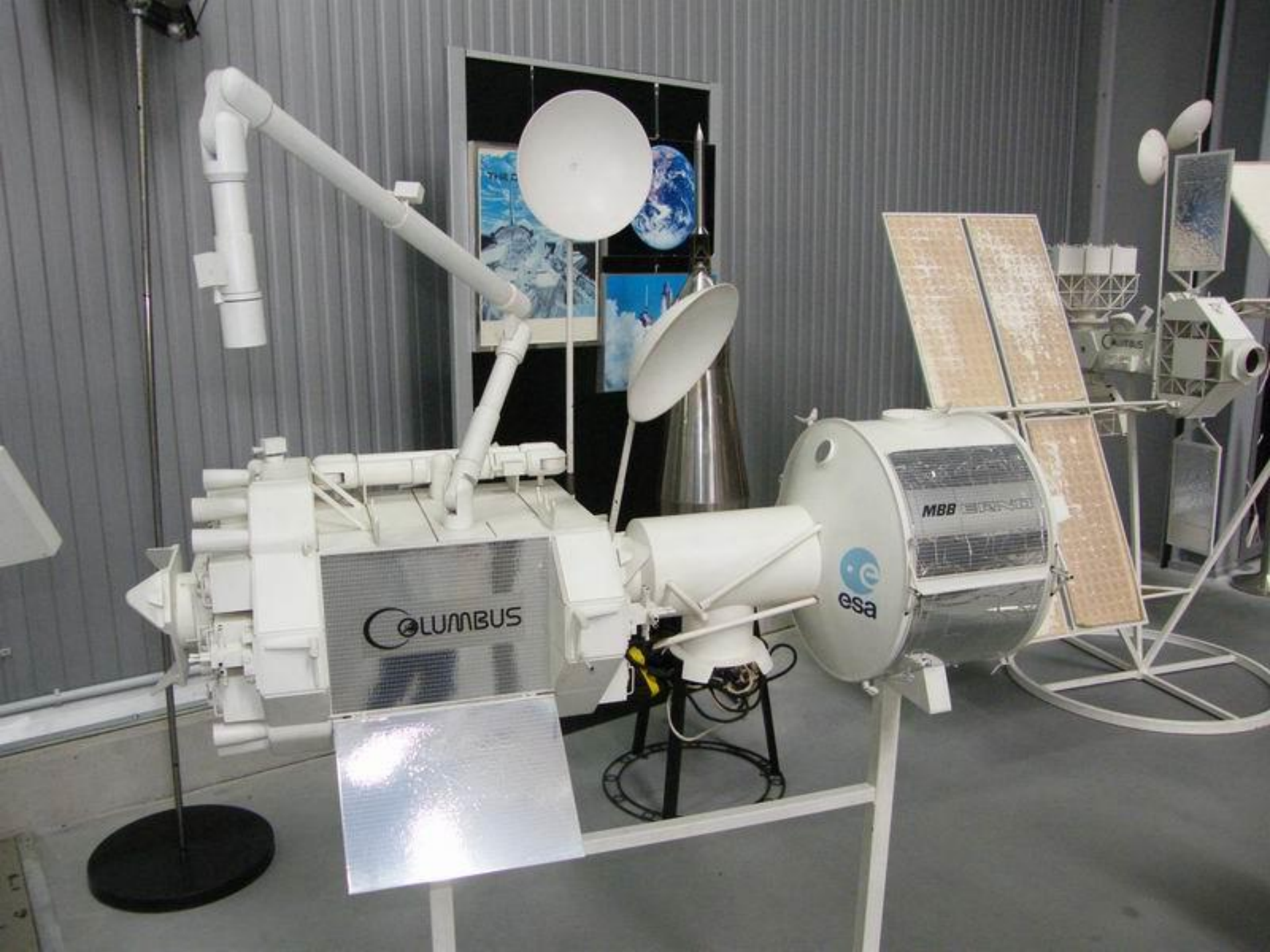
Dynamická role družic


SPACE INDUSTRIES

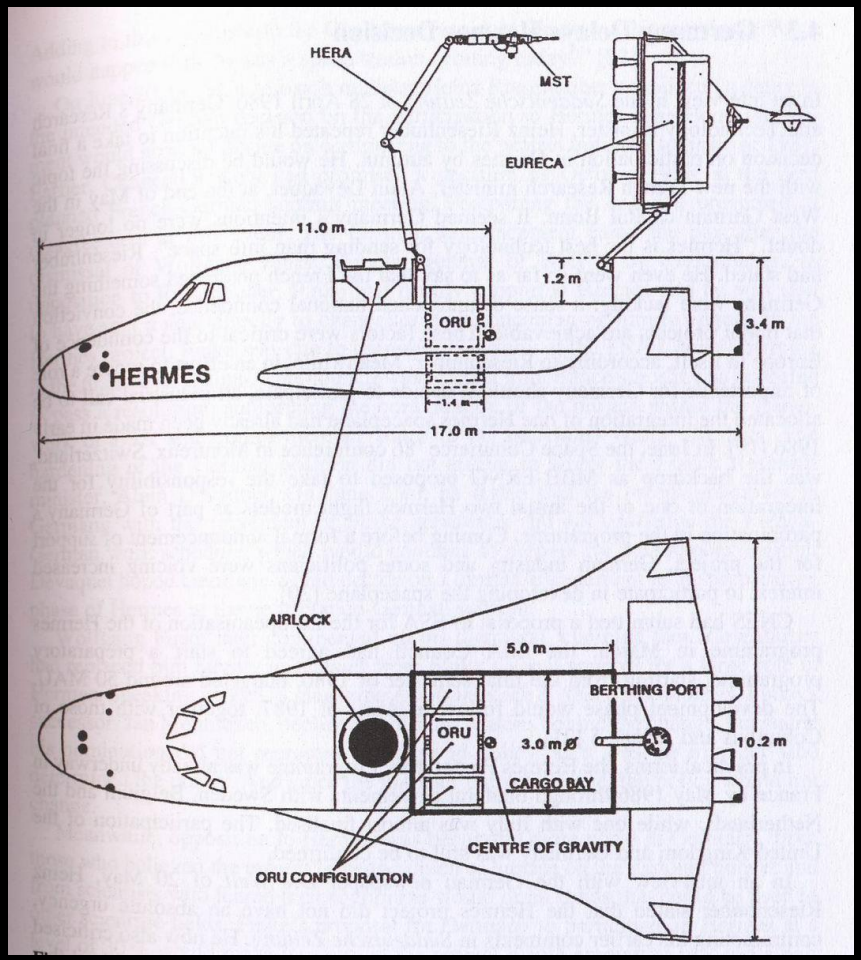

CASE + COIFFE
14885
H10
6950
64726
H60
18983
23908
Ø 5000
Ø 4200
Ø 3800
3500
60391

Leden 1984 – Ronald Reagan




COLUMBUS
esa

Únor 1984

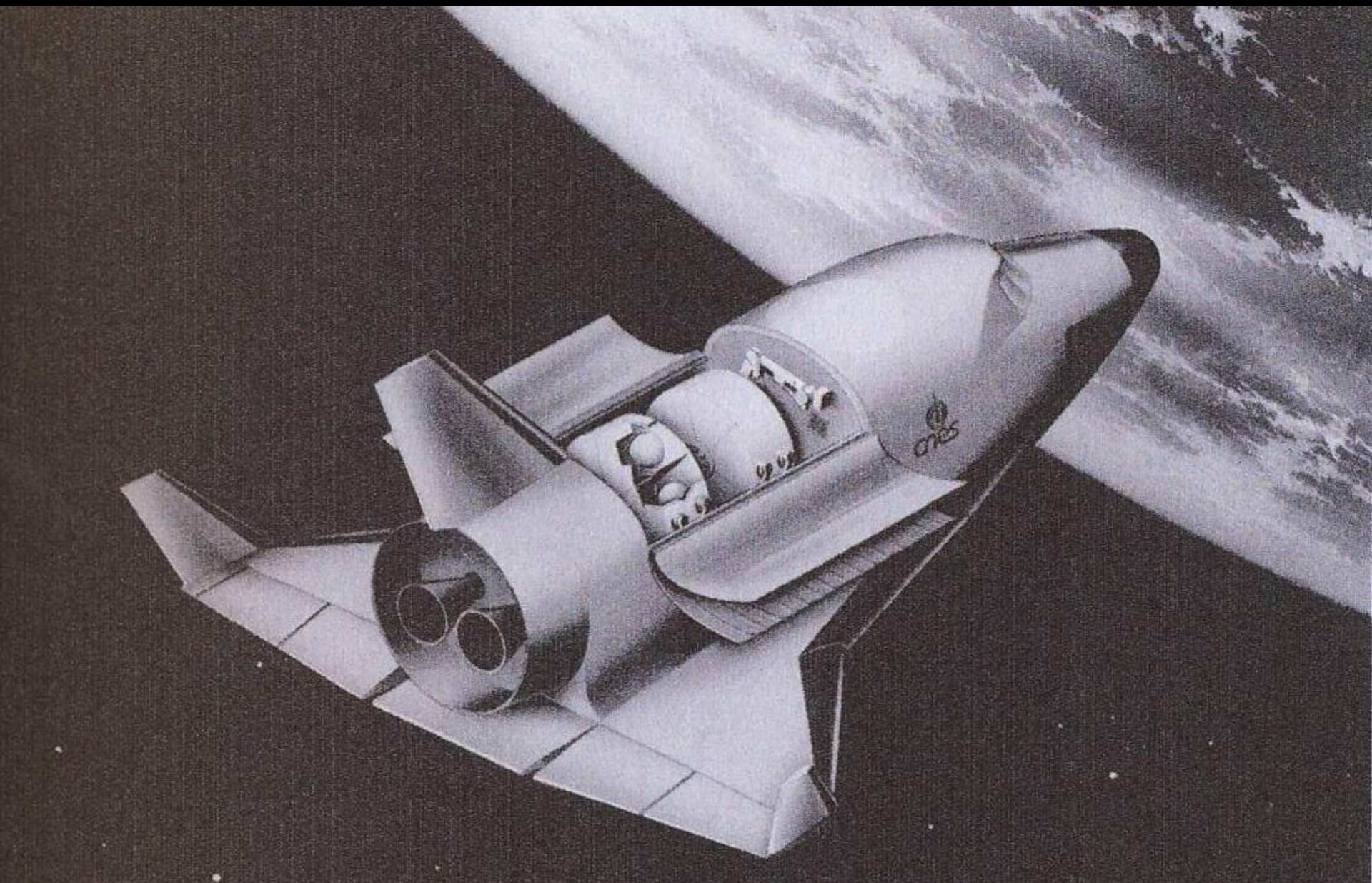


15 až 18 m, 16,7 t, 4500 kg

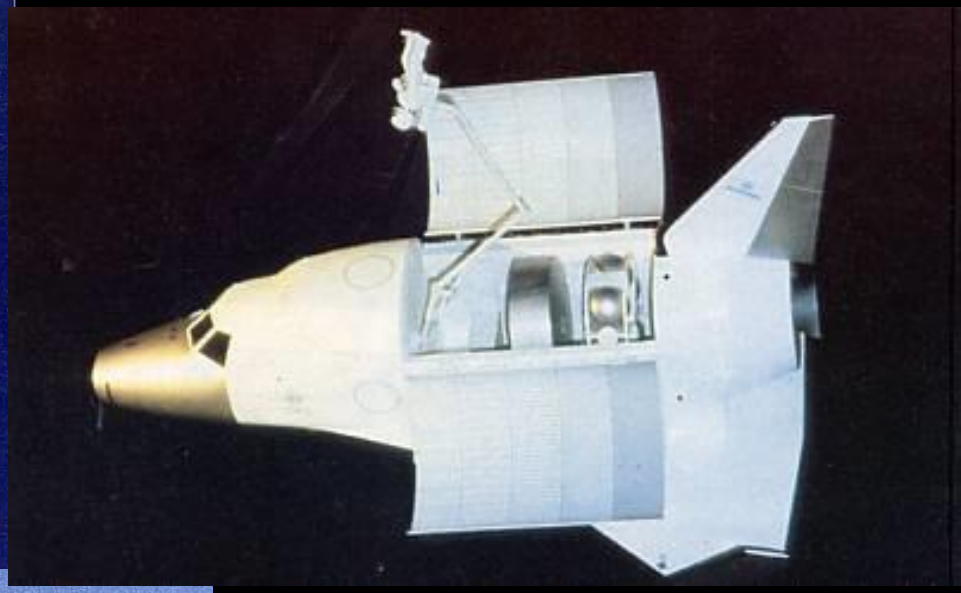
Červen 1984: ESA

Plus 50 procent

Duben 1985: Aerospatiale

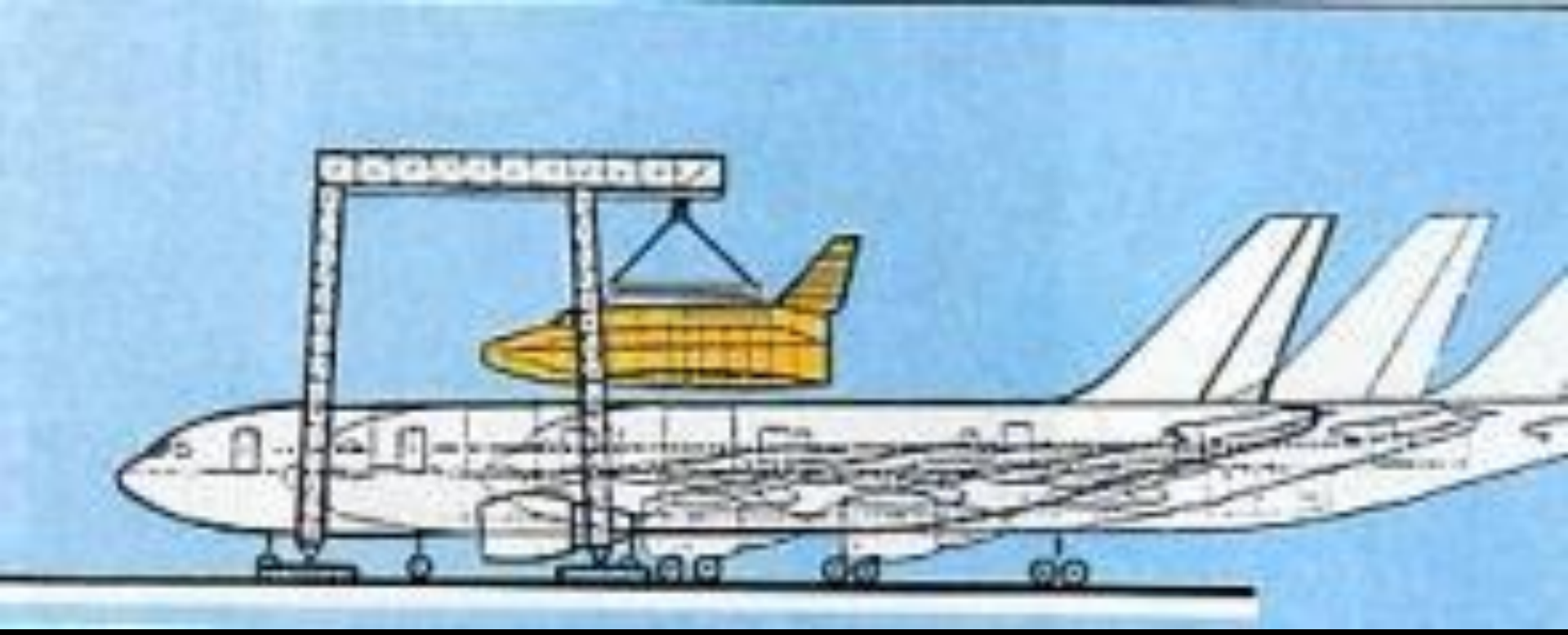


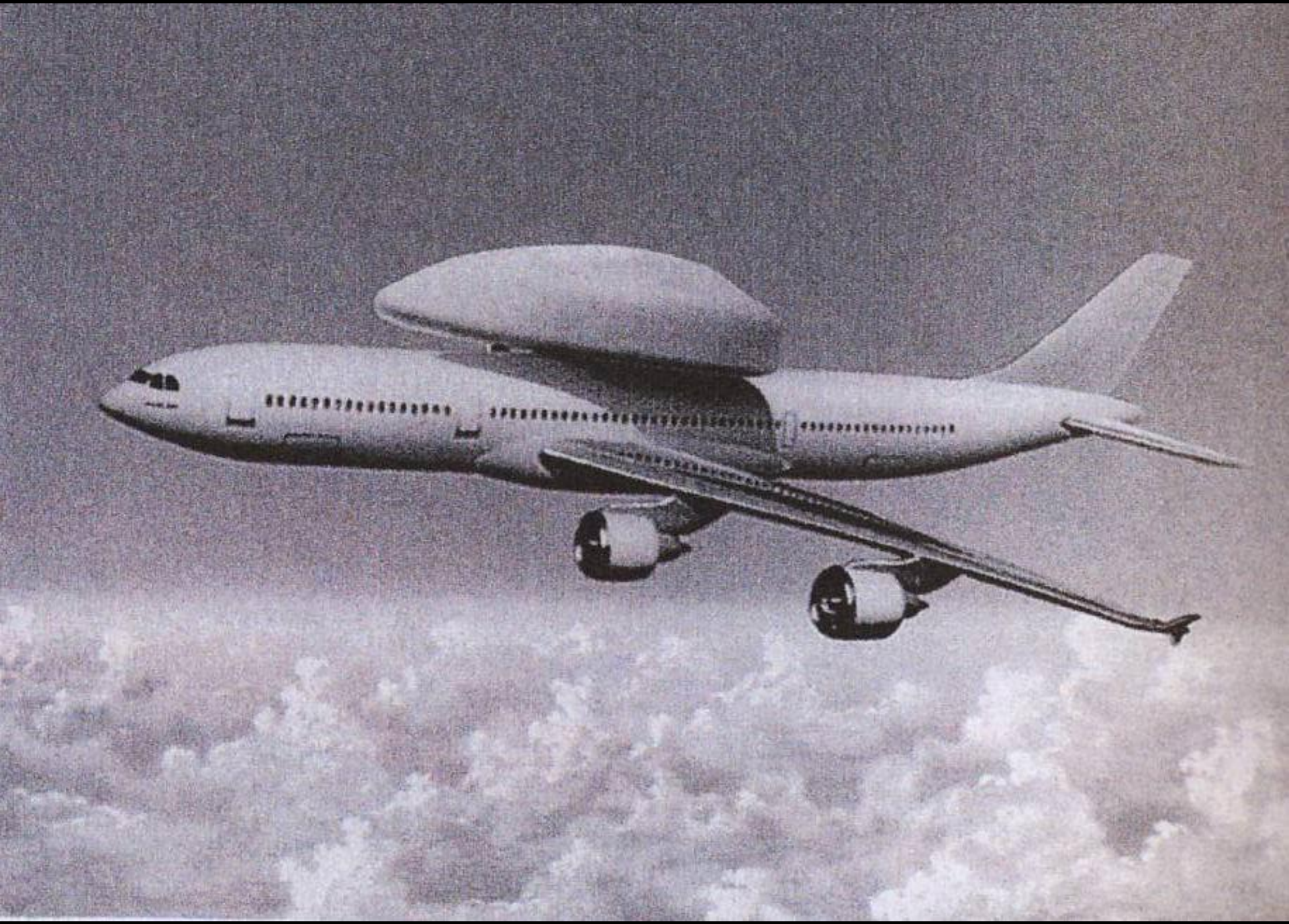

cnes




HERMES
aerospatiale
cnes

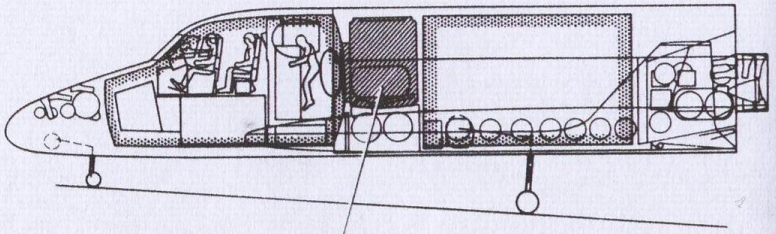

A300
cnes
aerospatiale
CORREIA-LACROIX

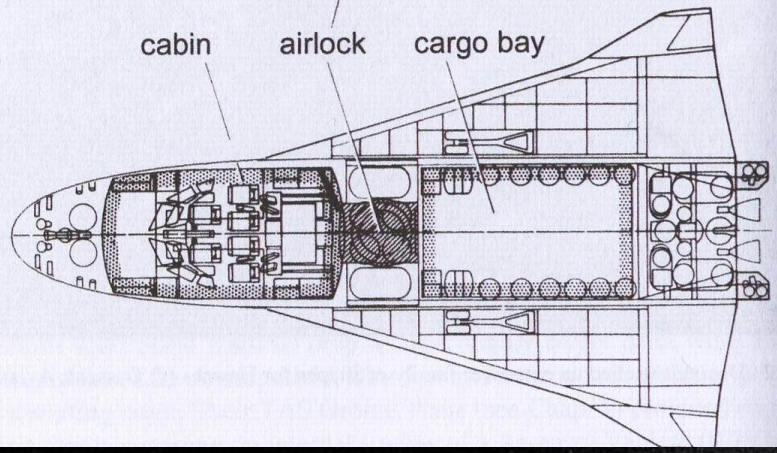


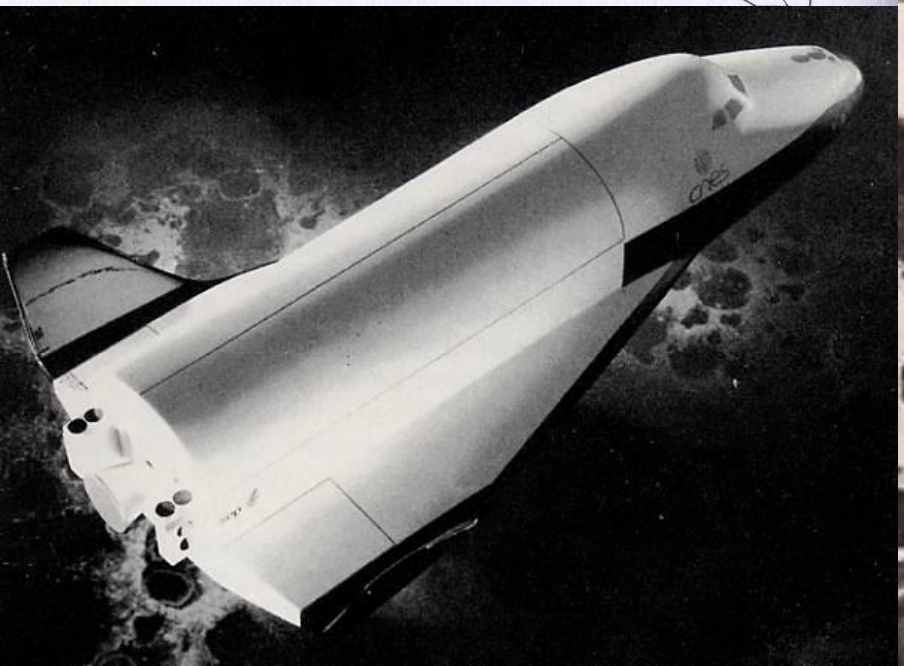


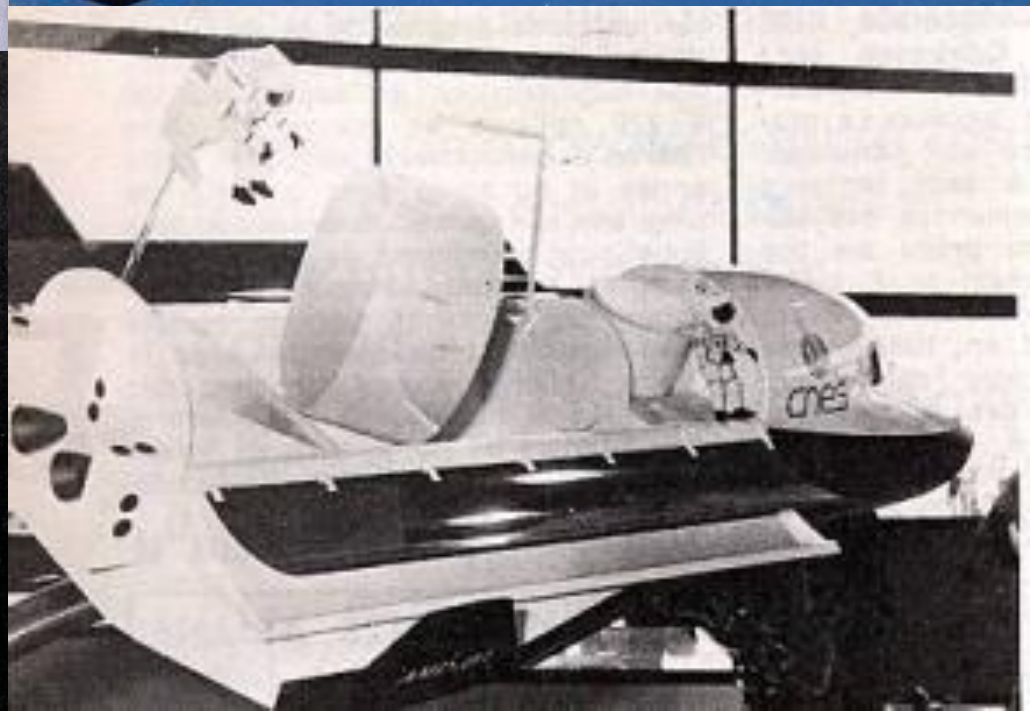
Duben 1985: Dassault

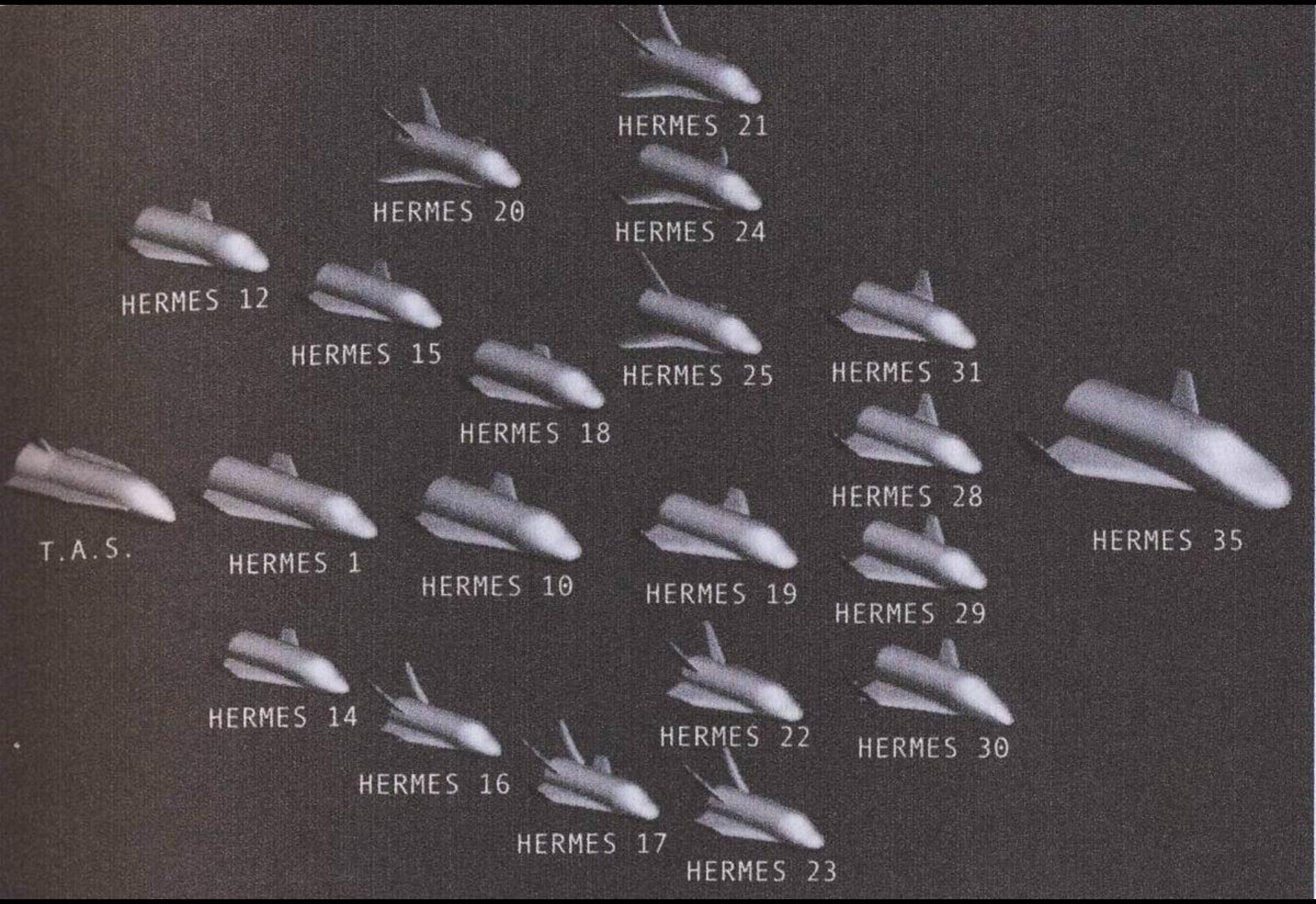
HERMES 5D



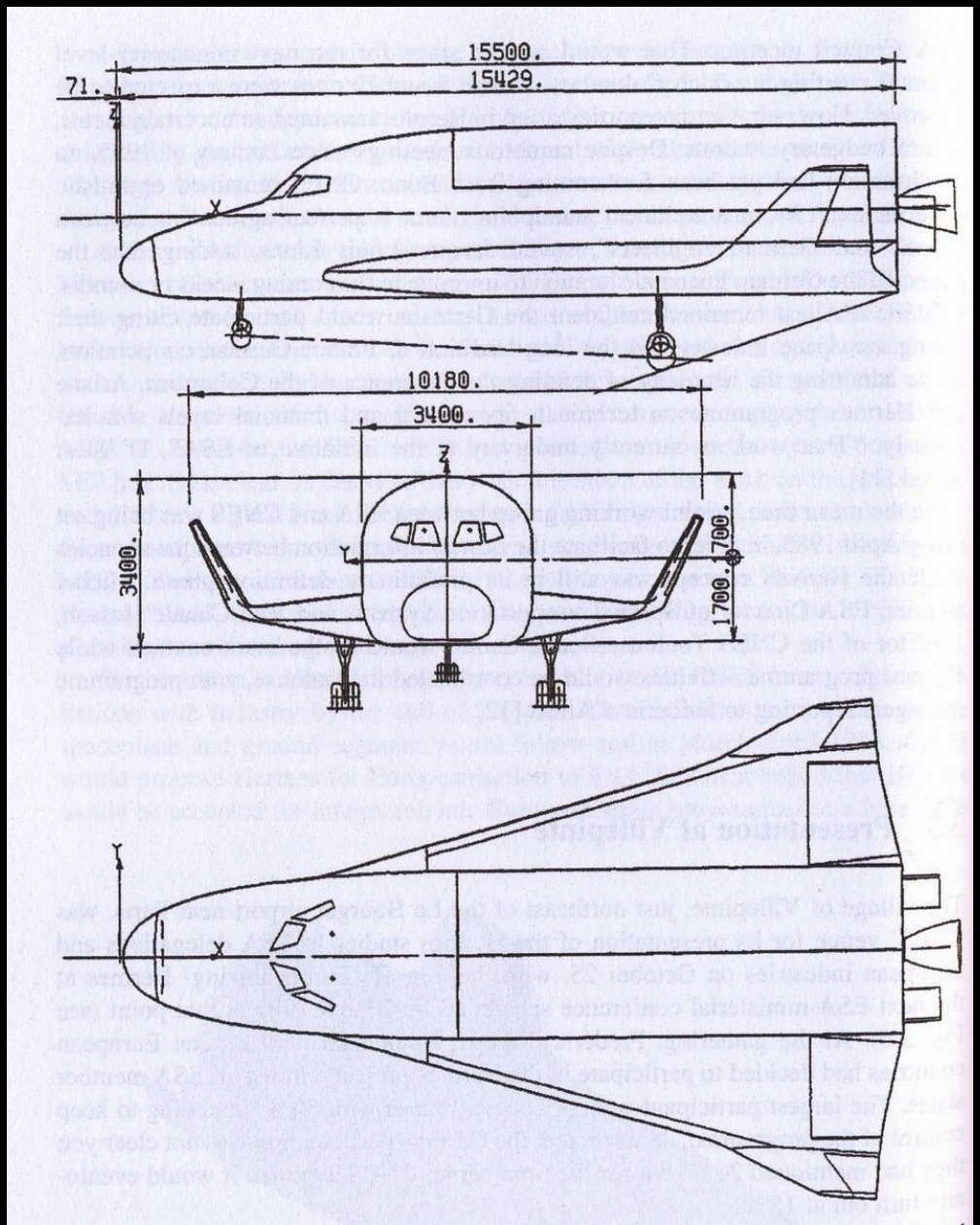


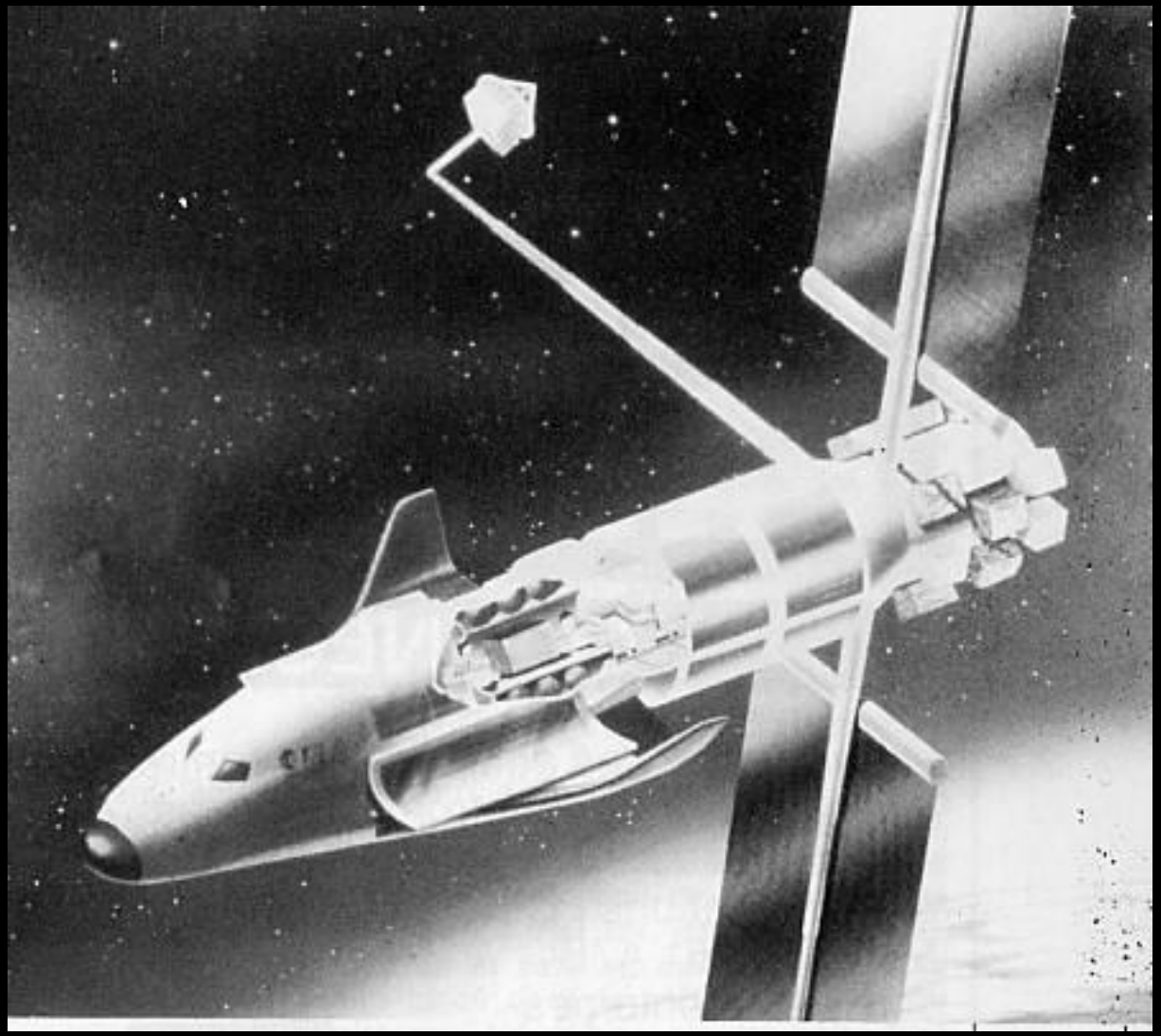




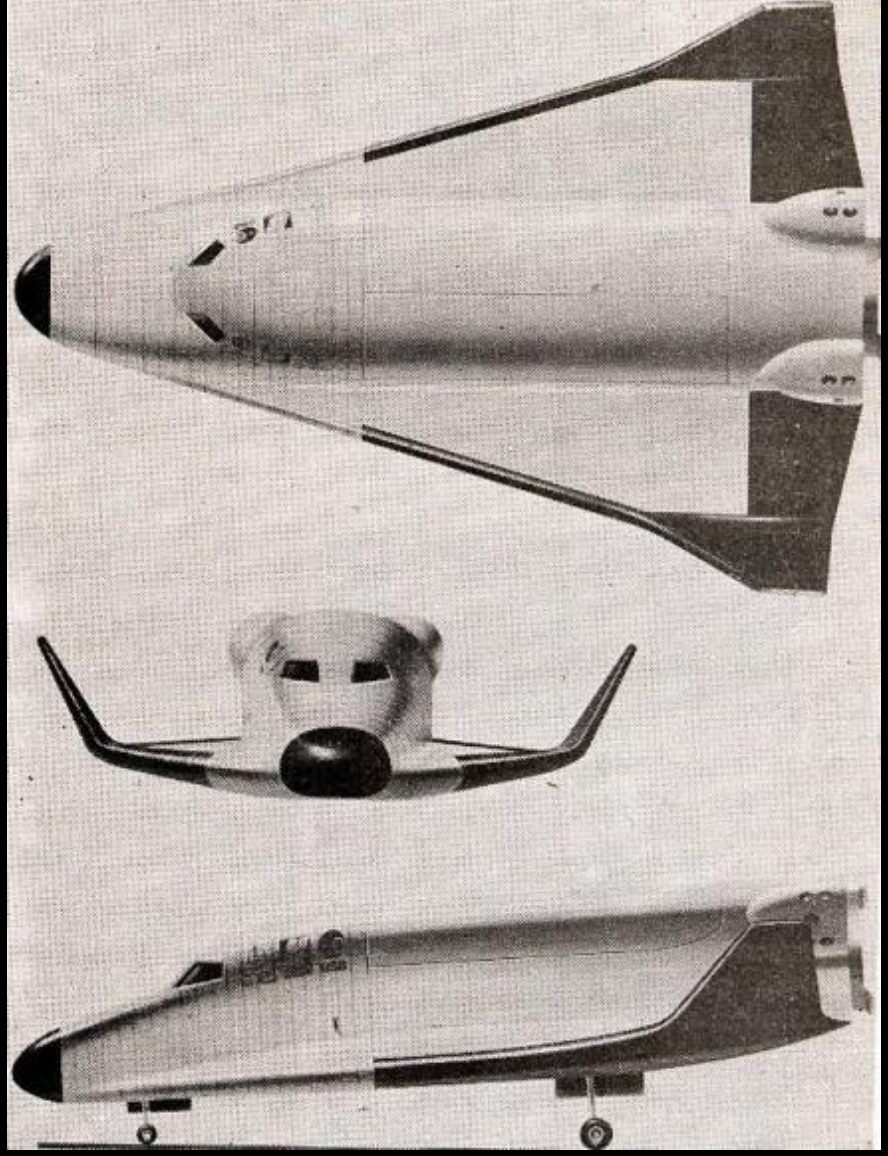

HERMES 21
HERMES 20
HERMES 24
HERMES 12
HERMES 15
HERMES 25
HERMES 31
HERMES 18
HERMES 28
HERMES 35
T.A.S.
HERMES 1
HERMES 10
HERMES 19
HERMES 29
HERMES 14
HERMES 22
HERMES 30
HERMES 16
HERMES 17
HERMES 23

Kompromis…





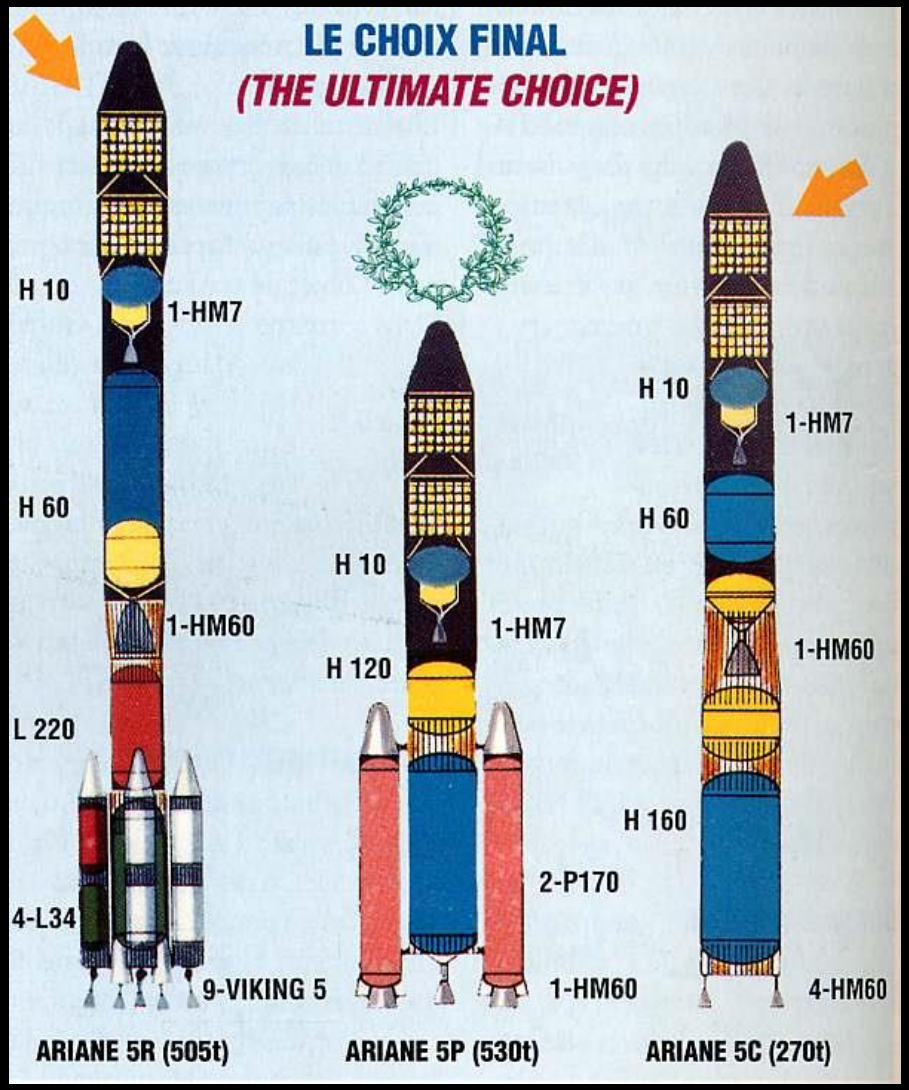
Samostatné mise (dálkový průzkum, biologie apod.), setkávací mise, obsluha stanic.



Hermes 01 a 02.

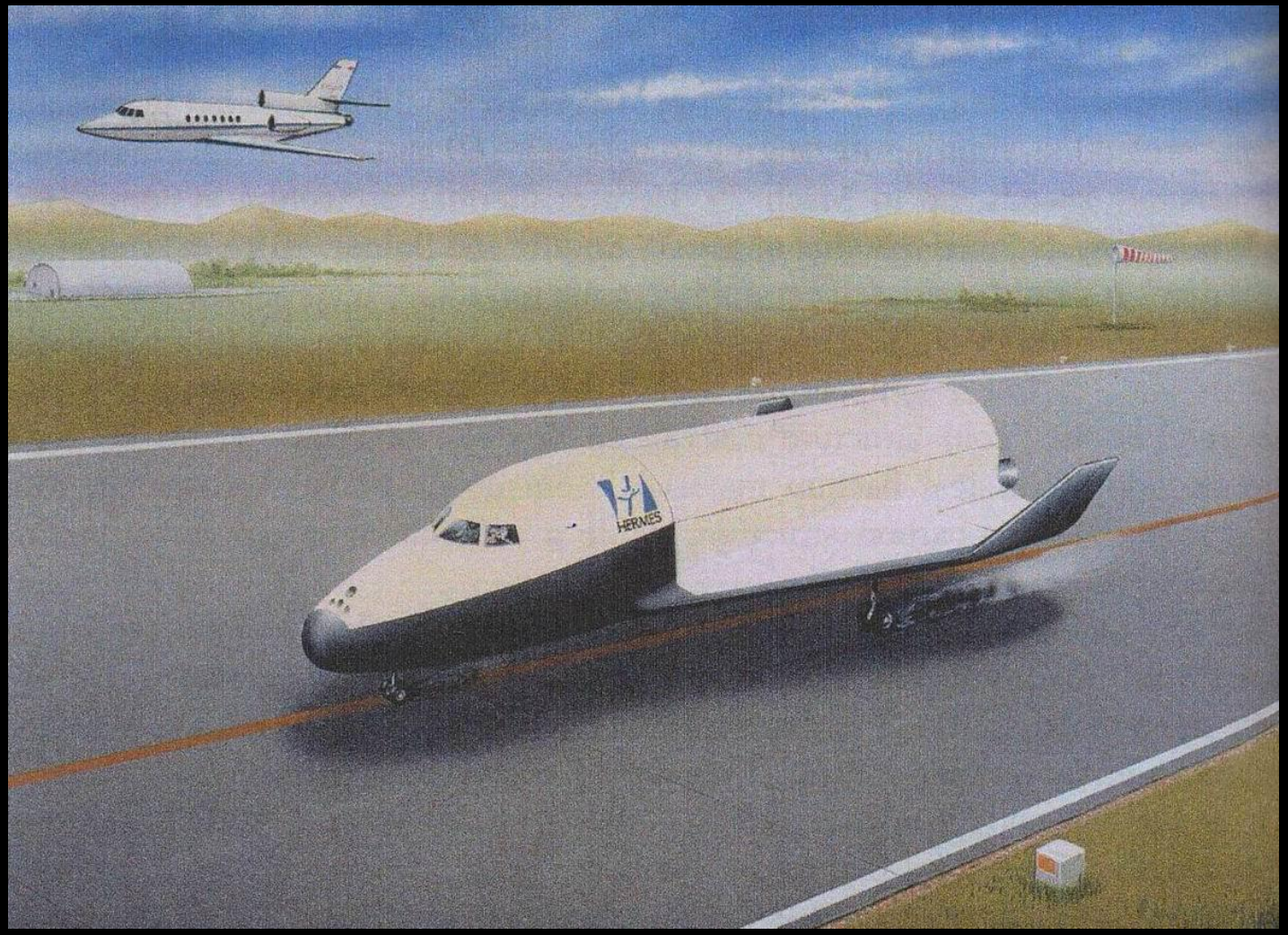
Každý 30 misí za 15 let.

1985



Ariane 5 a Hermes nezávislé.

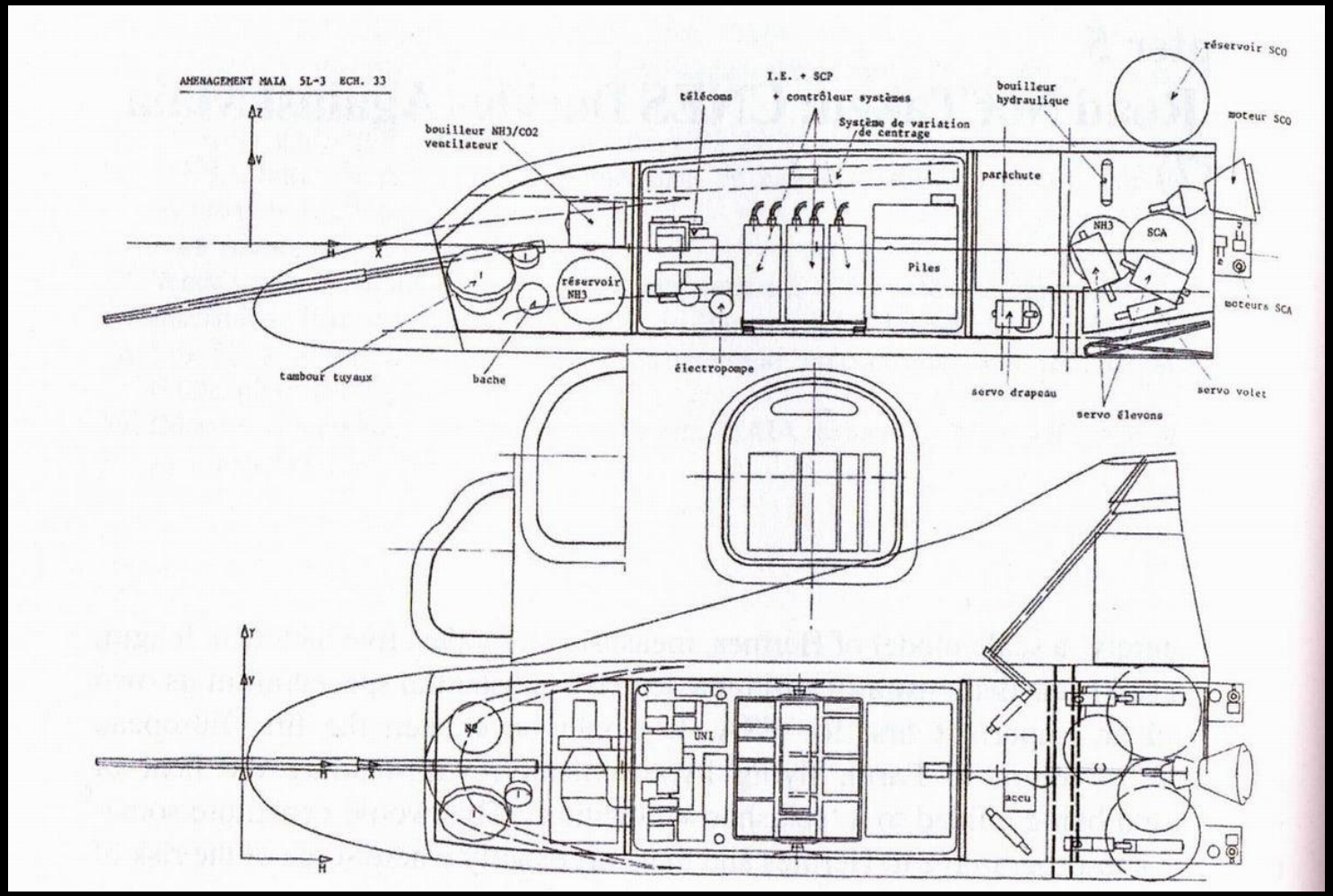
Říjen 1985 - Villepinte



Francie 42,5 procent, Německo až 30 procent.

Říjen 1985 - Řím

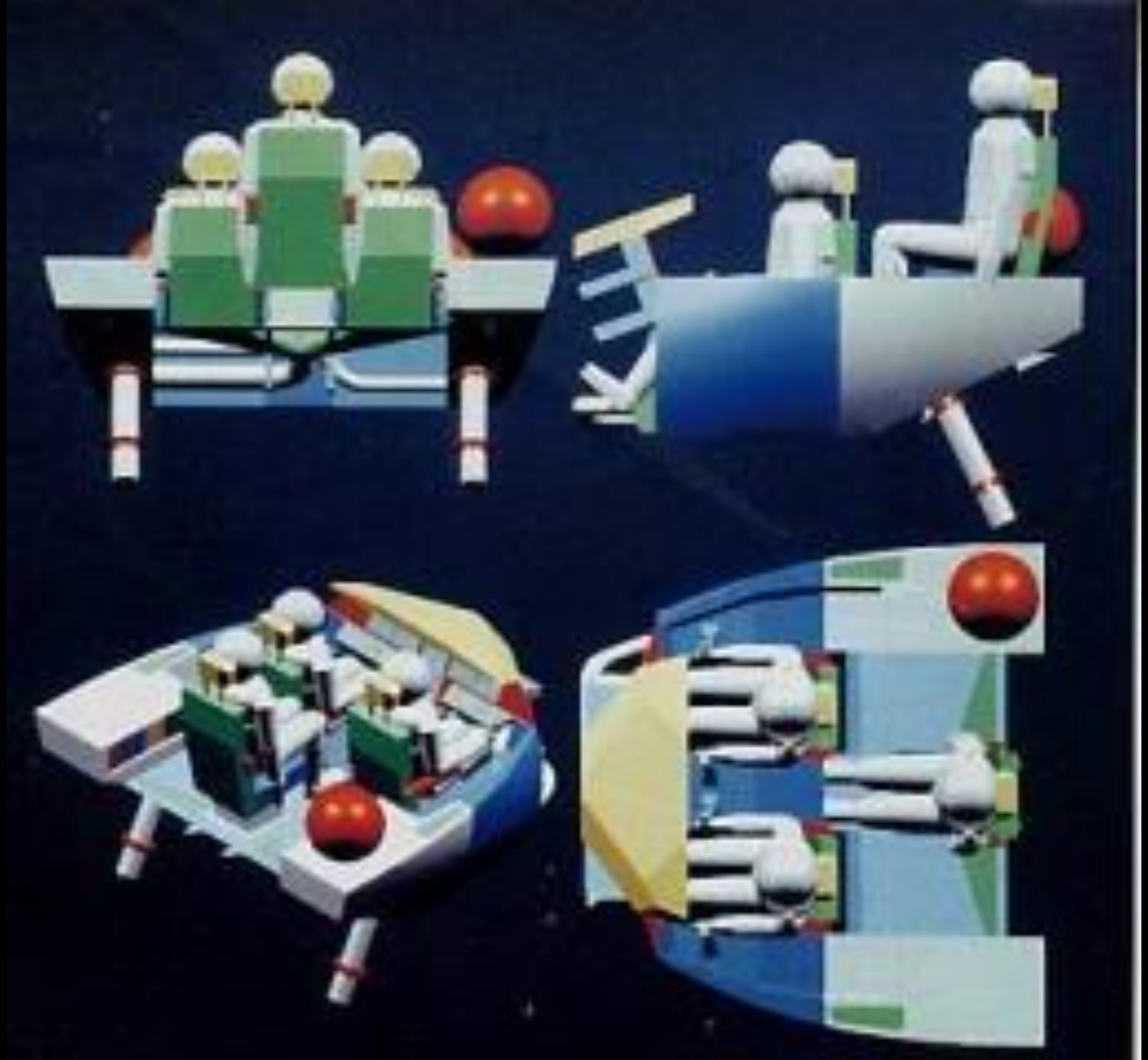
Maia

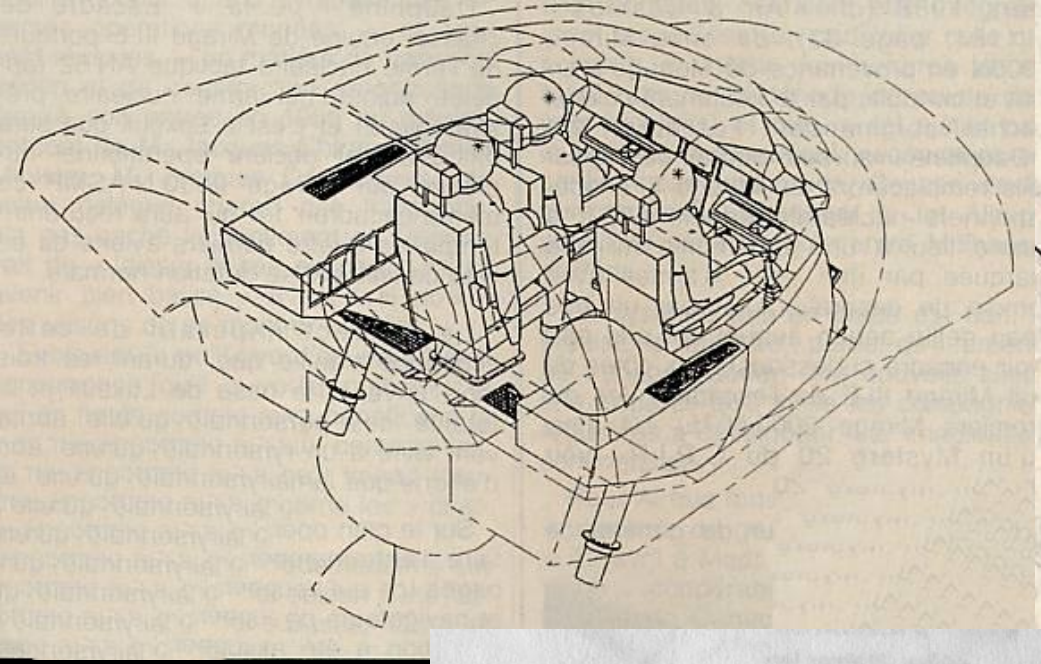


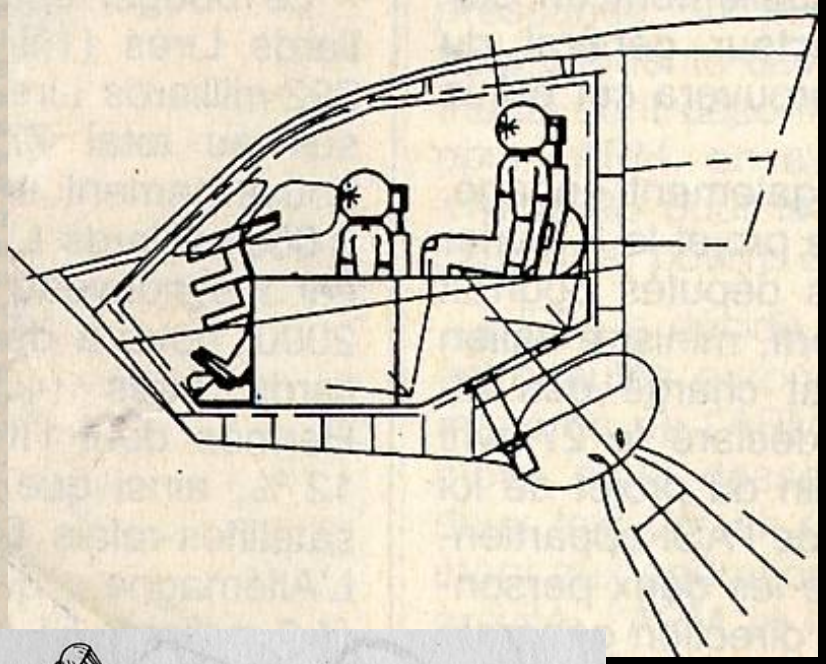
5,34 m, 1,7 t

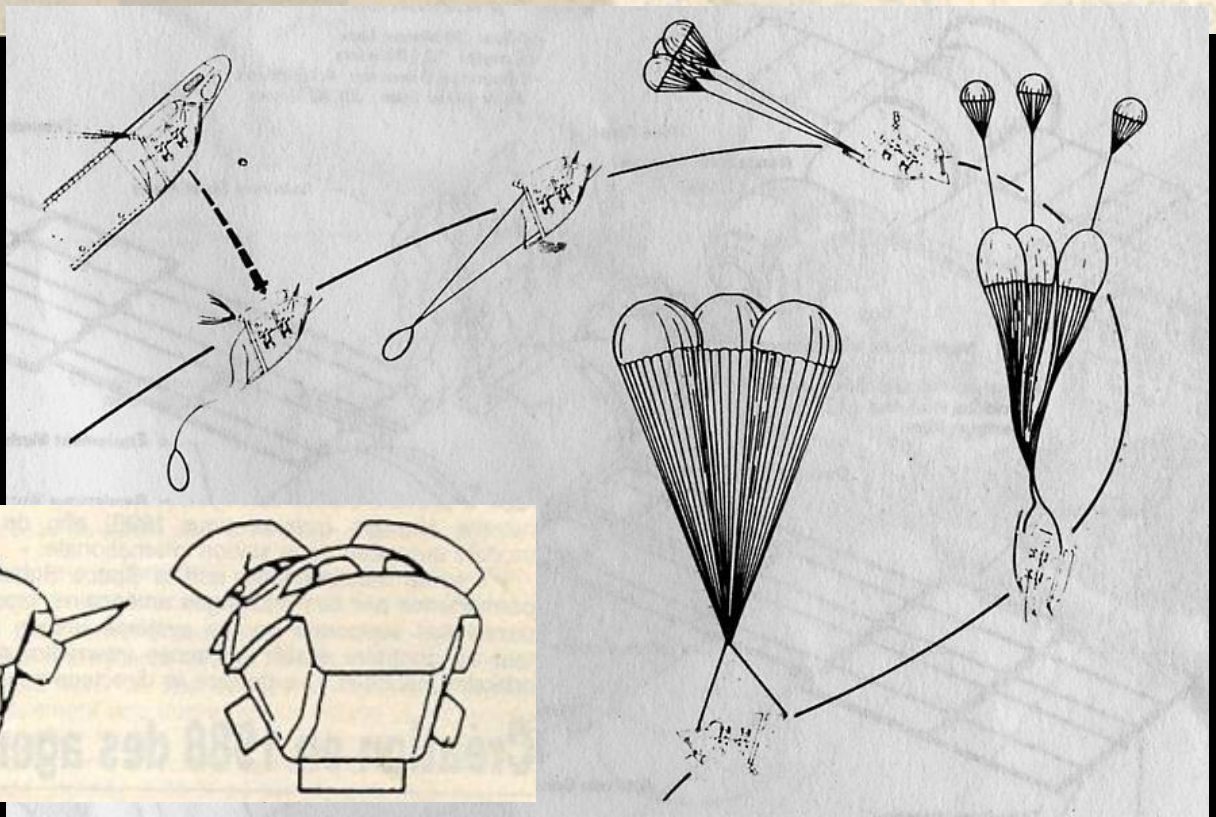
75 tisíc hodin testů

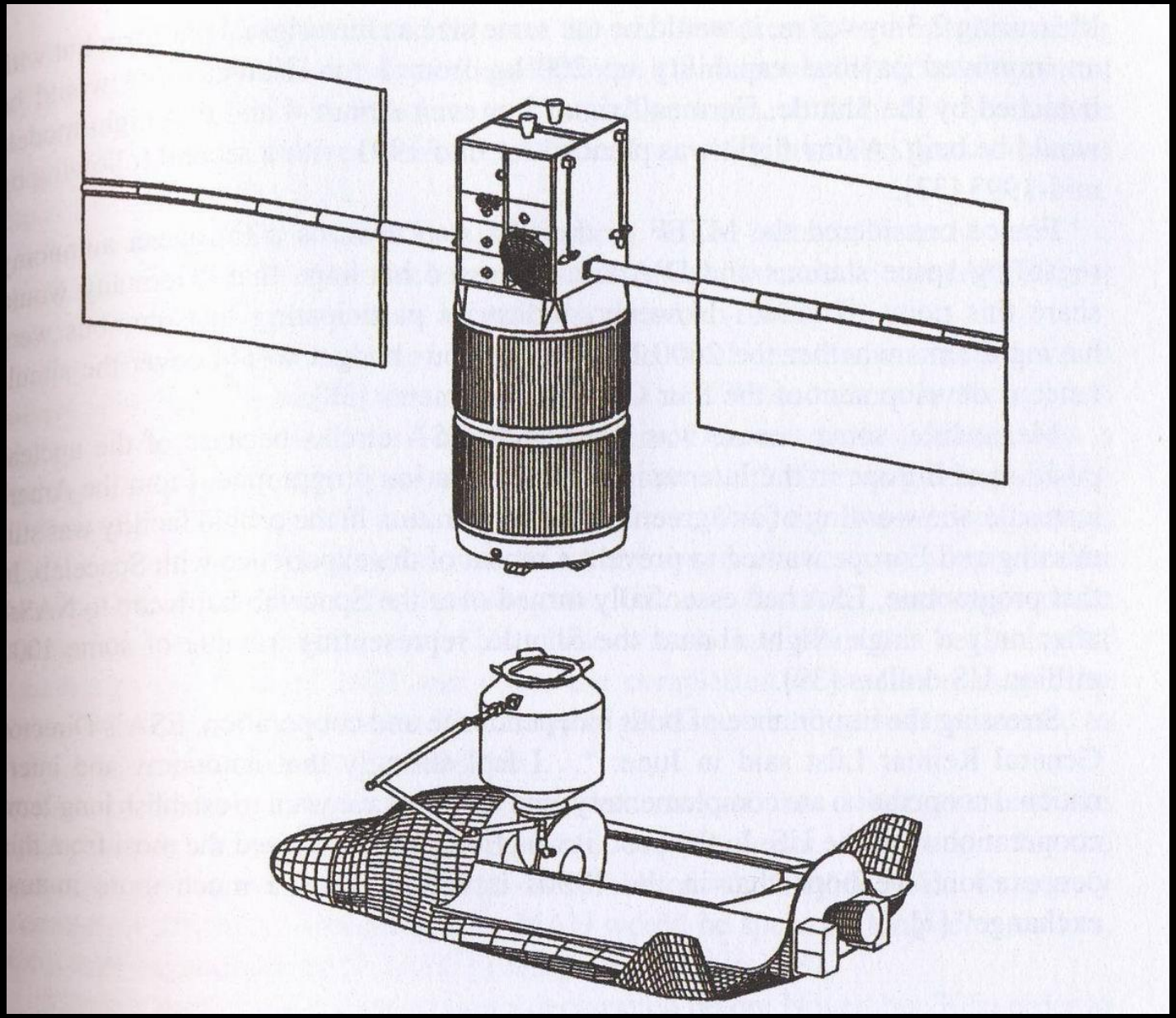
1986





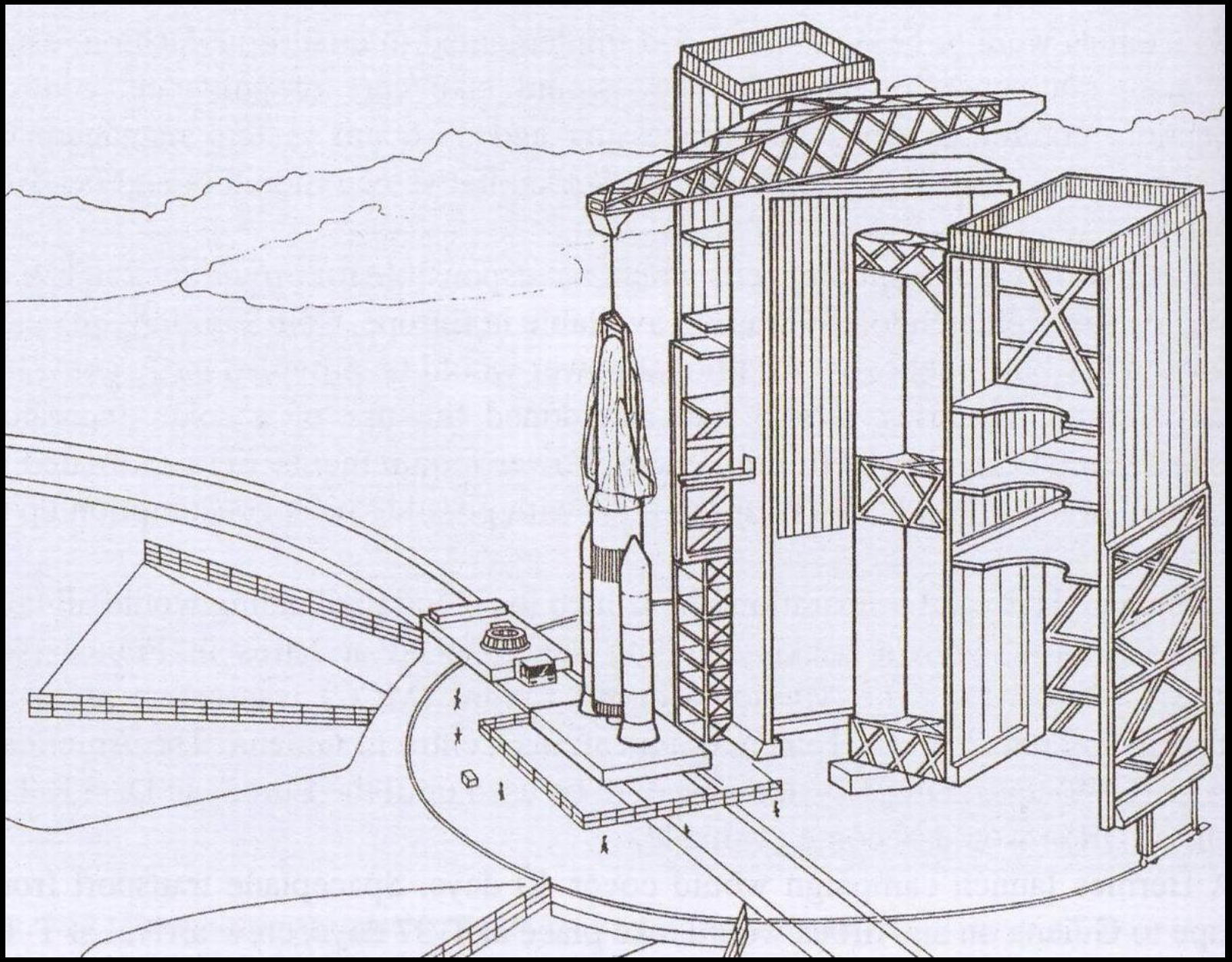




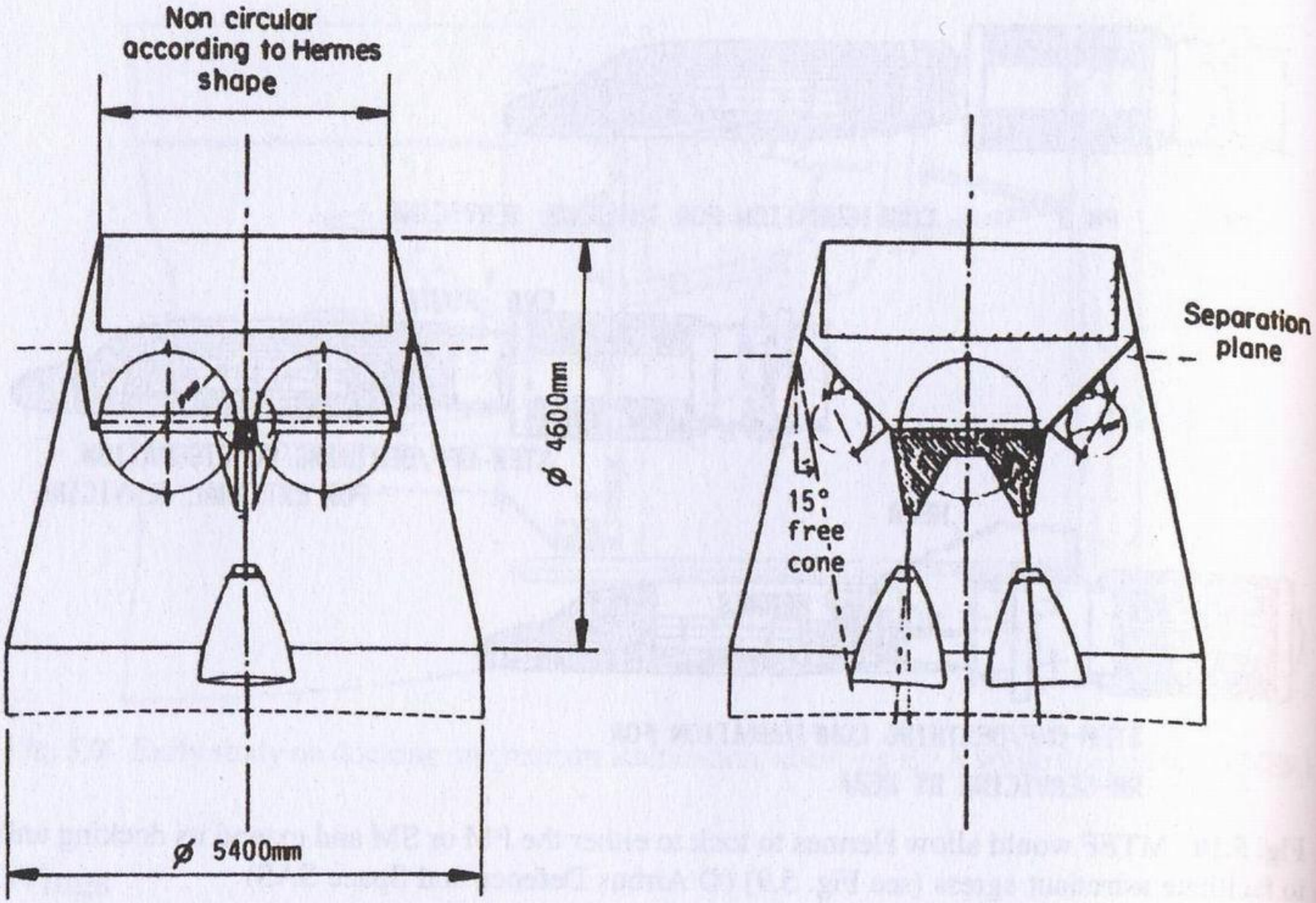


MTFF: Man-Tended Free Flyer

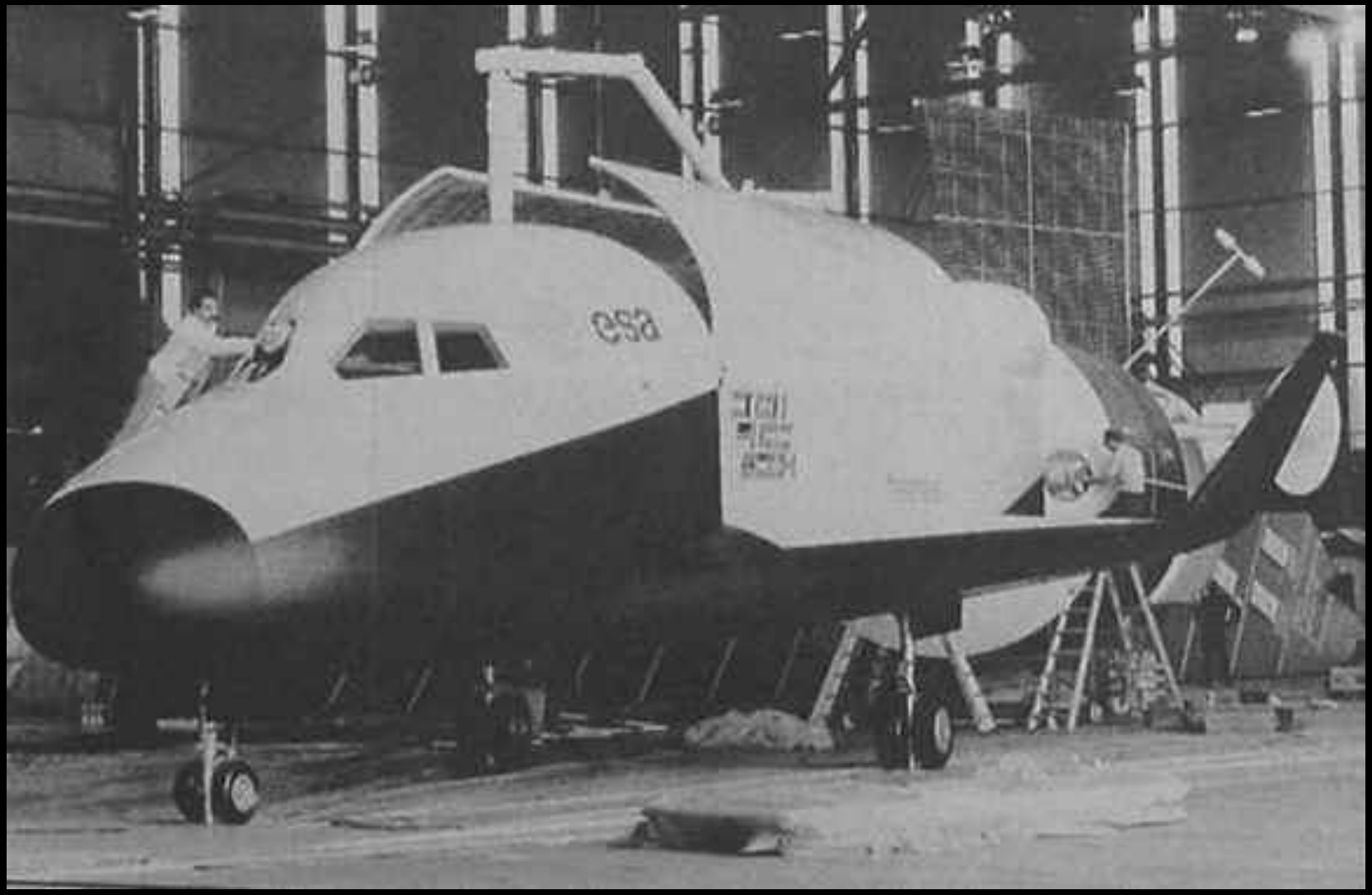
Červen 1986: roste Ariane 5



Únor 1987

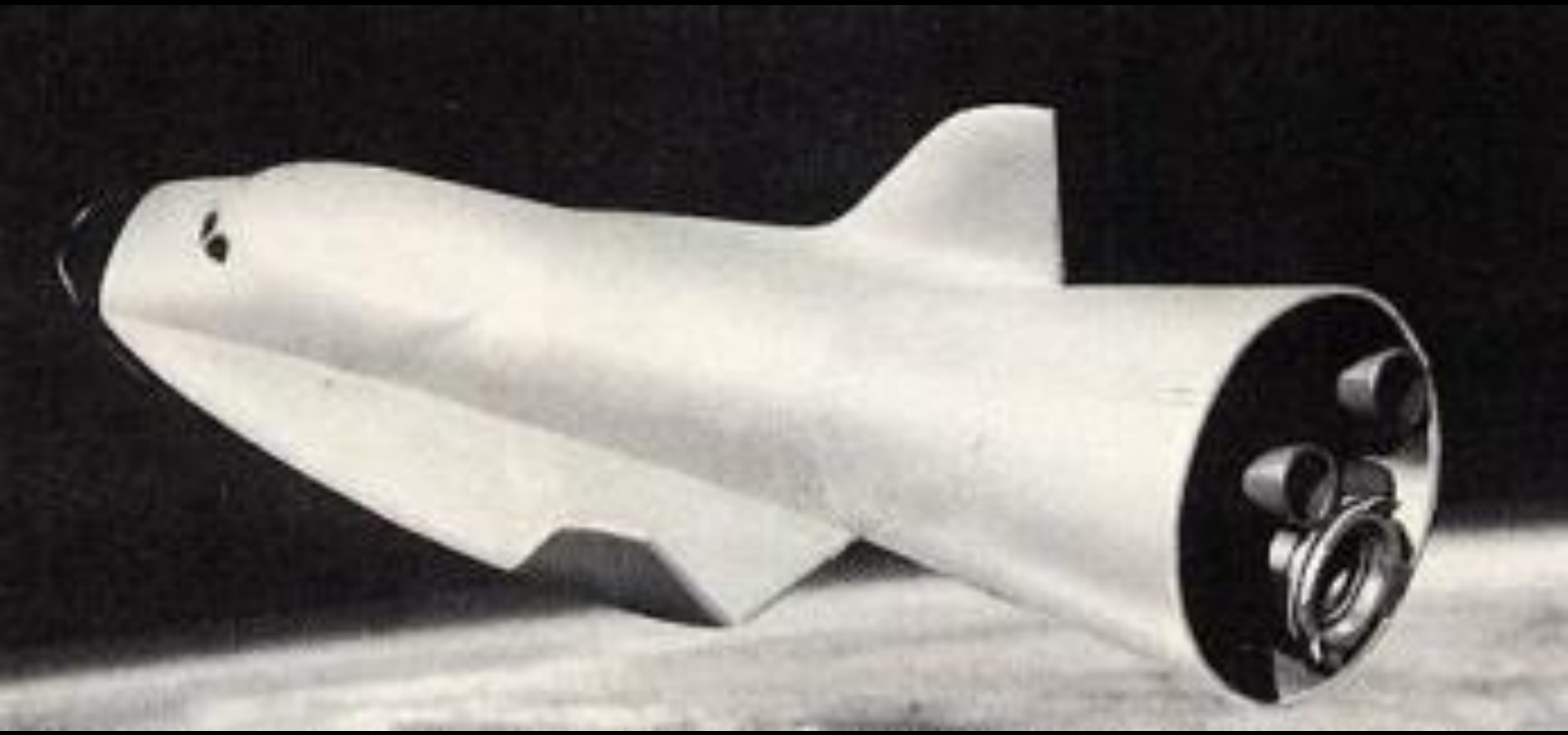

Non circular
according to Hermes
shape
ø 4600mm
ø 5400mm
Separation
plane
15°
free
cone

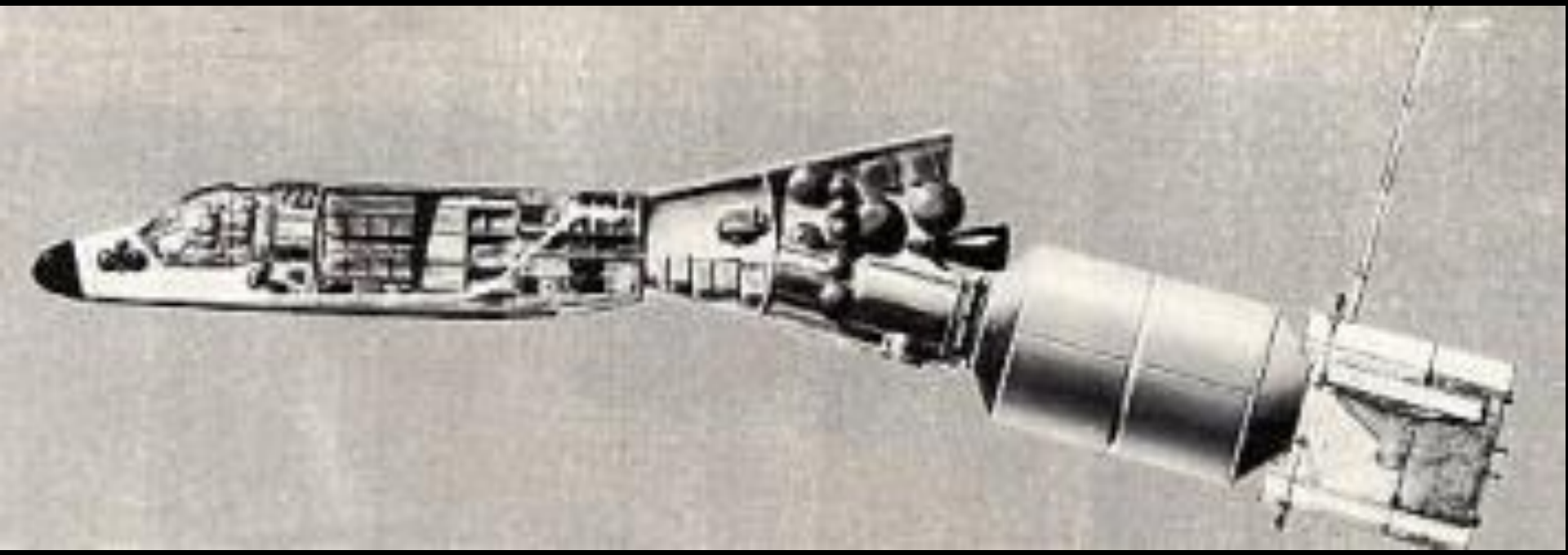
10. listopadu - Haag

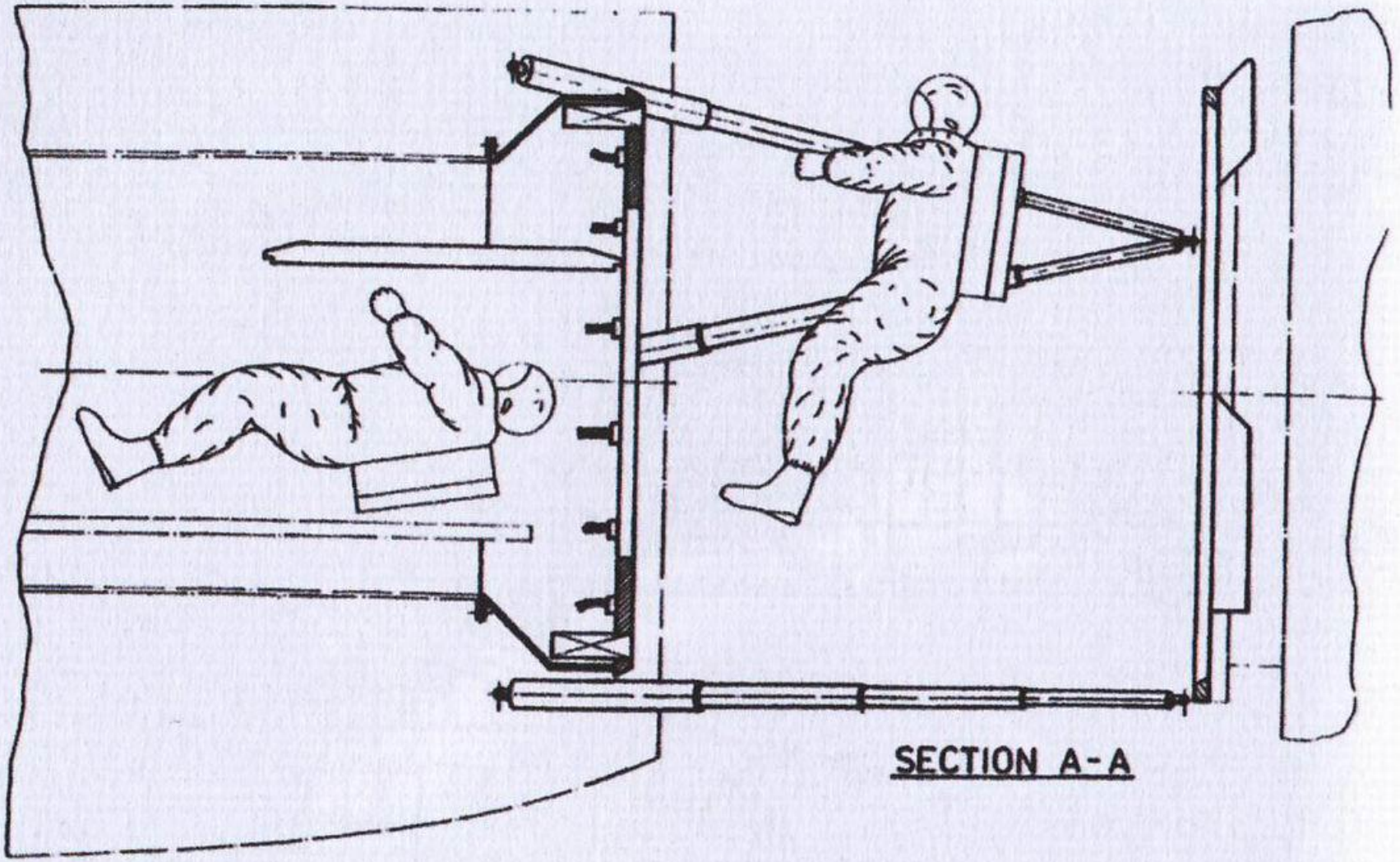


10 let vývoj, rozpočet 5,1 mld. USD

Prosinec 1988






SECTION A-A

Prosinec 1989

Fáze B z ledna na červenec 1991.

Pre-A – Návrh.

A – Uskutečnitelnost.

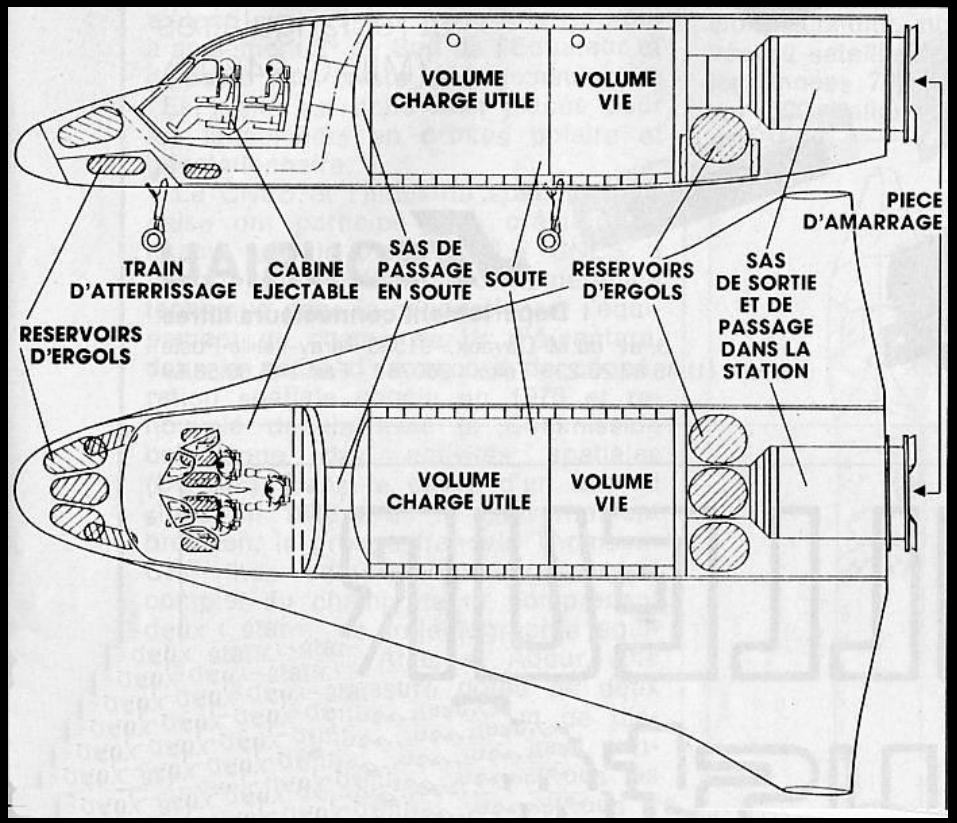
B – Potvrzení uskutečnitelnosti.

C – Průmyslový návrh subsystémů.

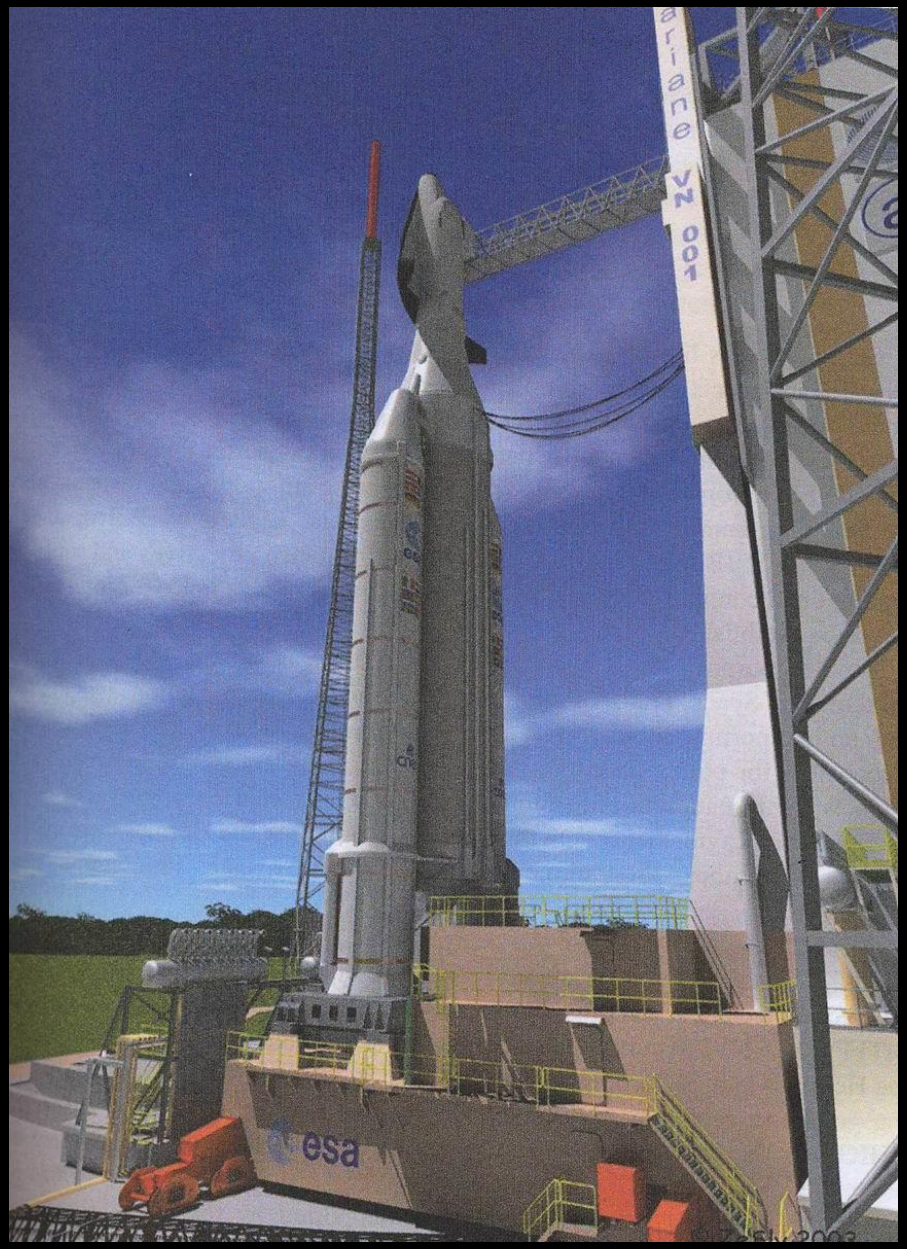
D – Výroba, integrace, testování a kvalifikace.

E – Operace.

F – Ukončení.



Únor, srpen 1990 – nová podoba



Říjen 1990

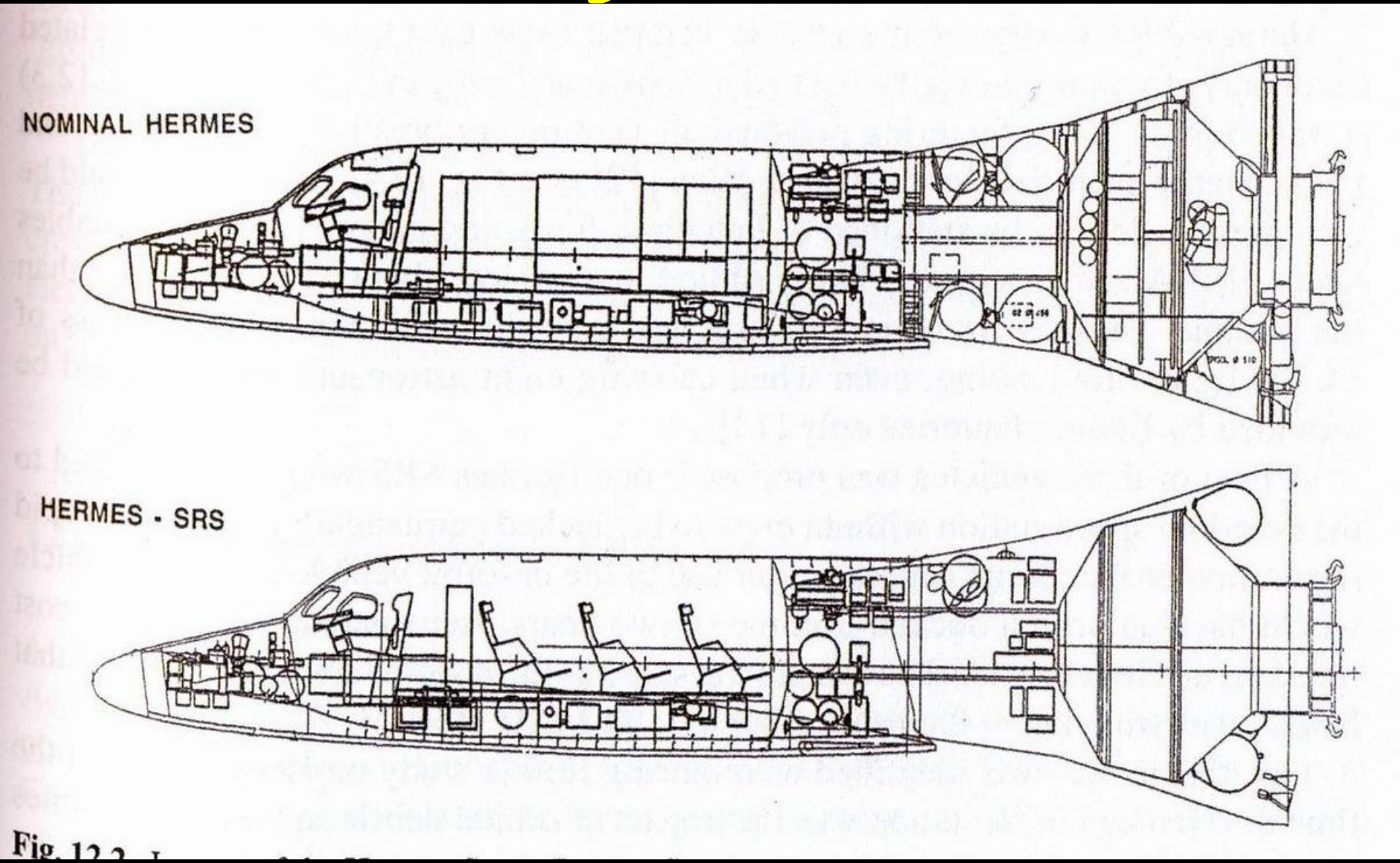
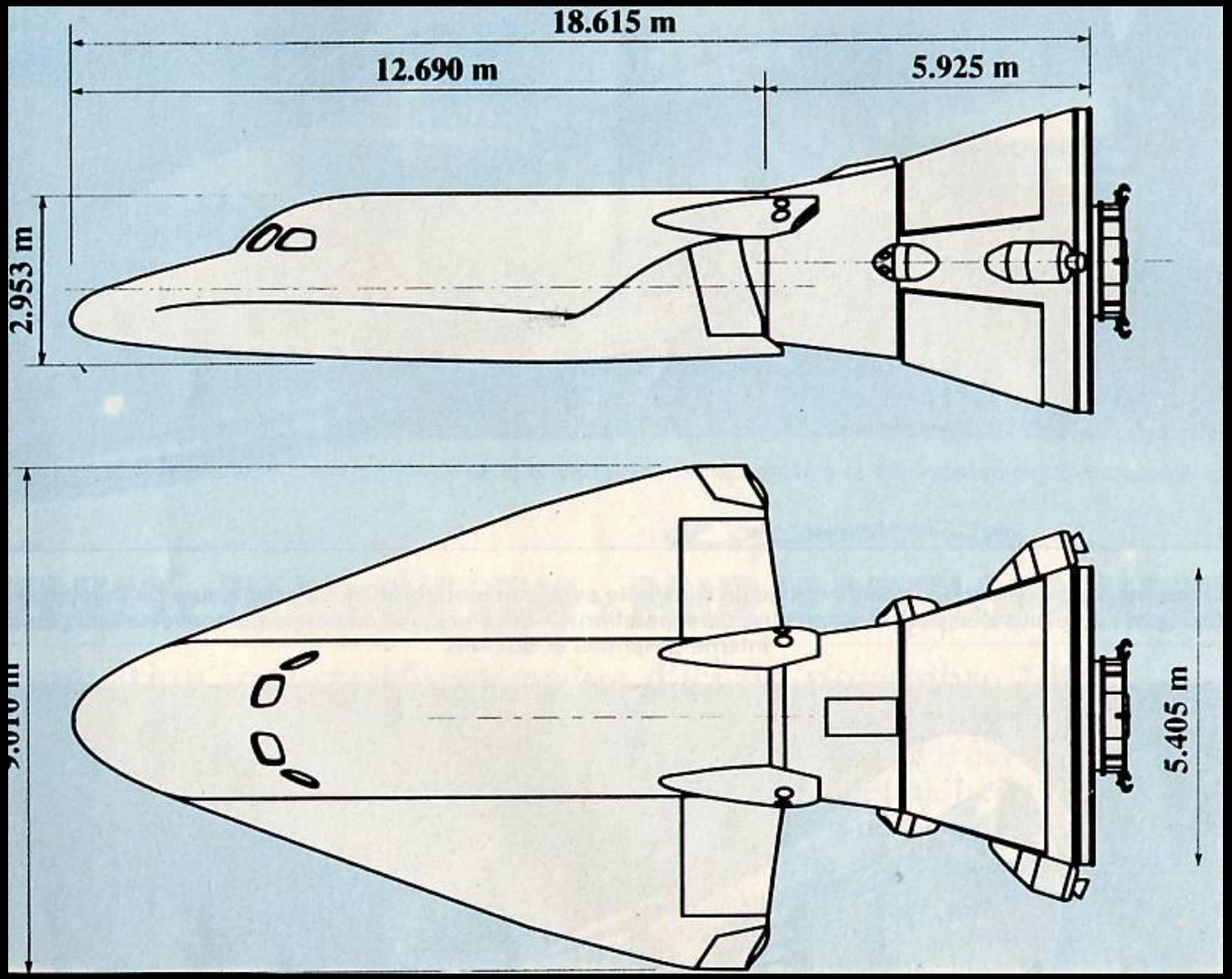


Fig. 12.2

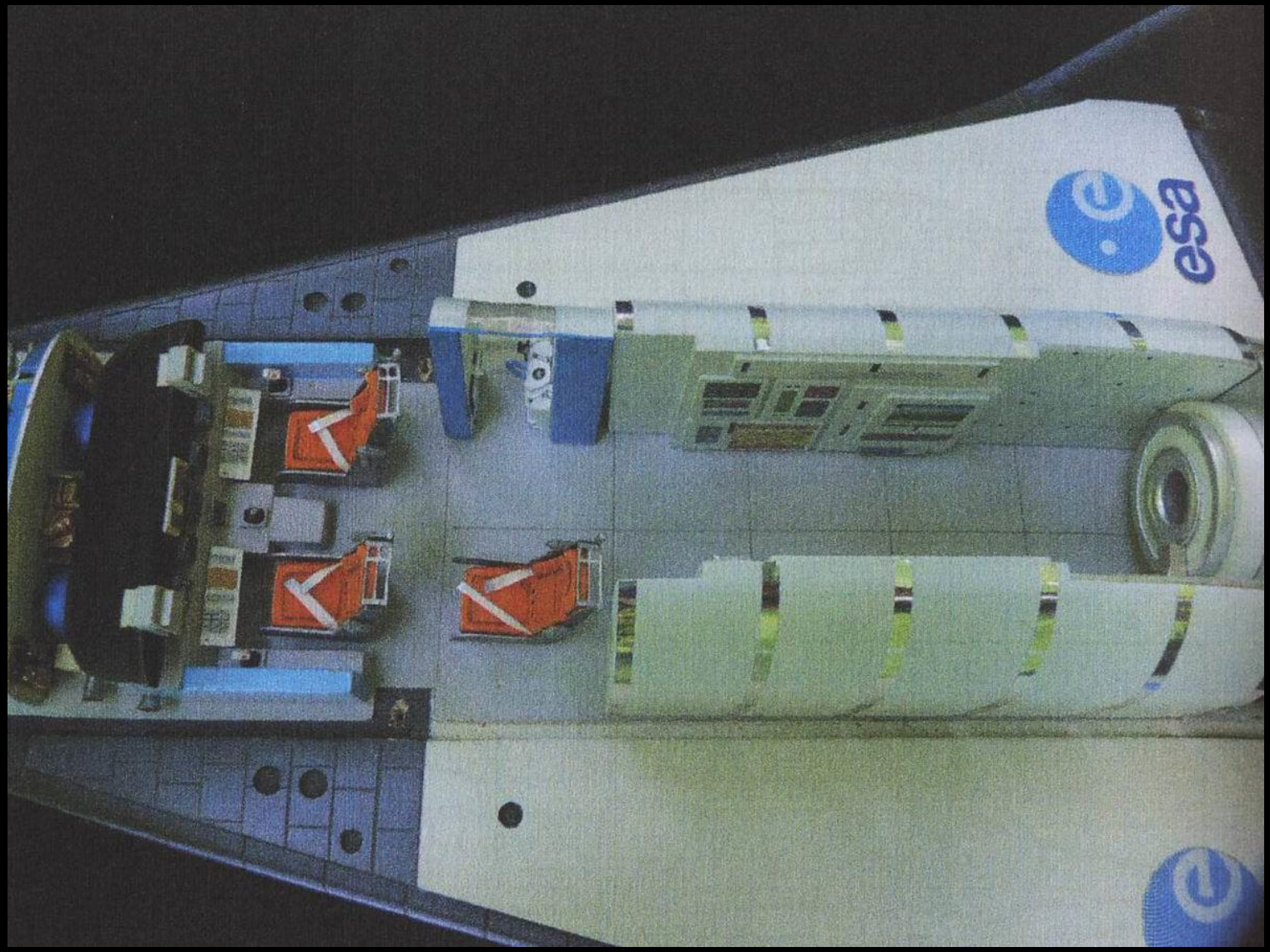
Hermes Space Rescue System

Říjen 1990



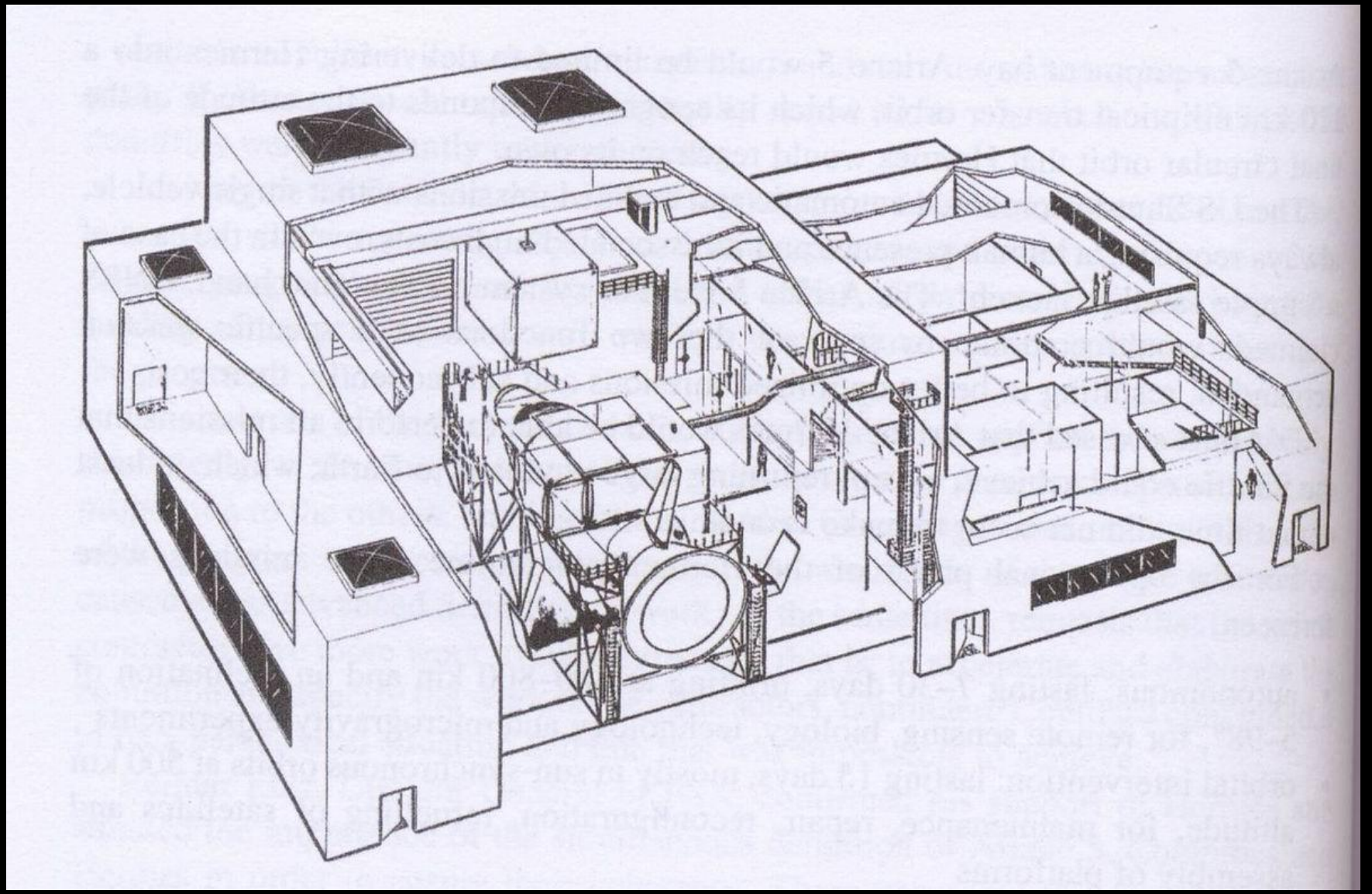
Náklady + 25 procent, ne start 1998.

Únor 1991



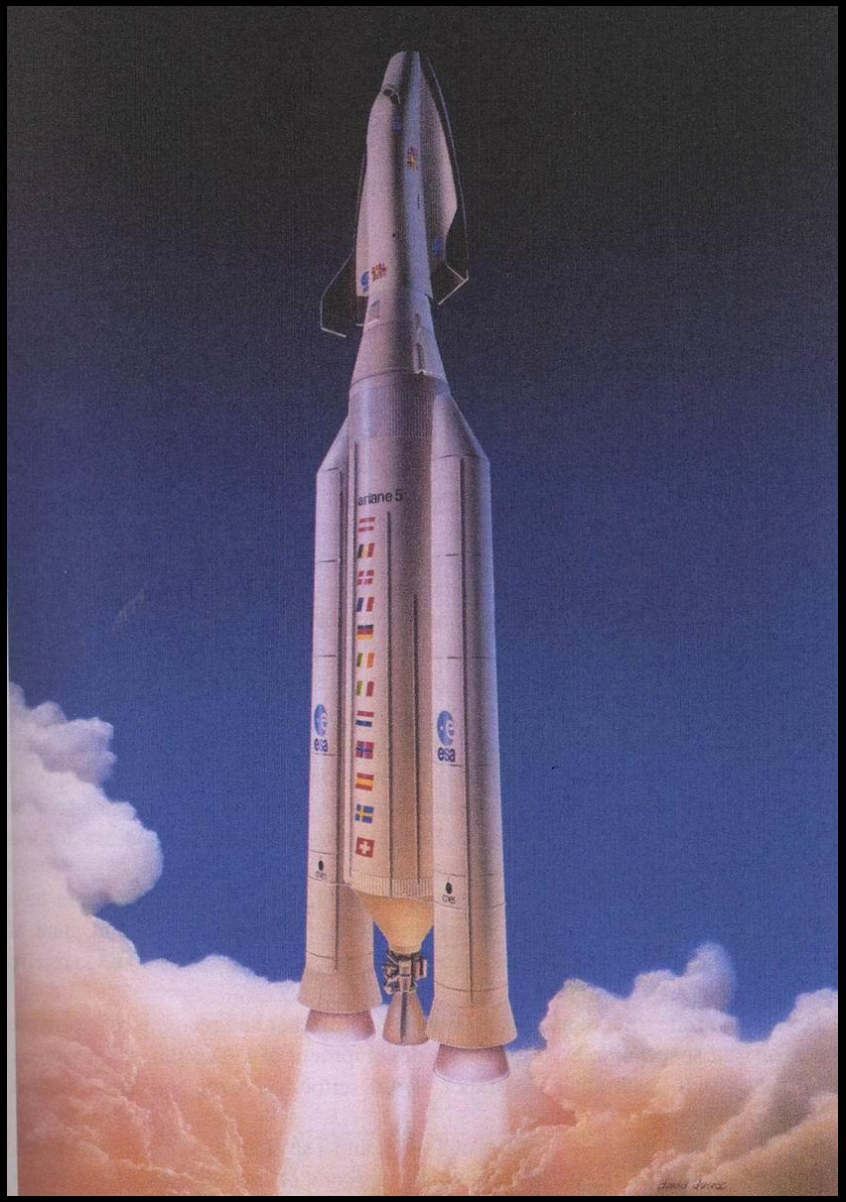
Premiéra 2000, jen jeden stroj.

Březen 1991



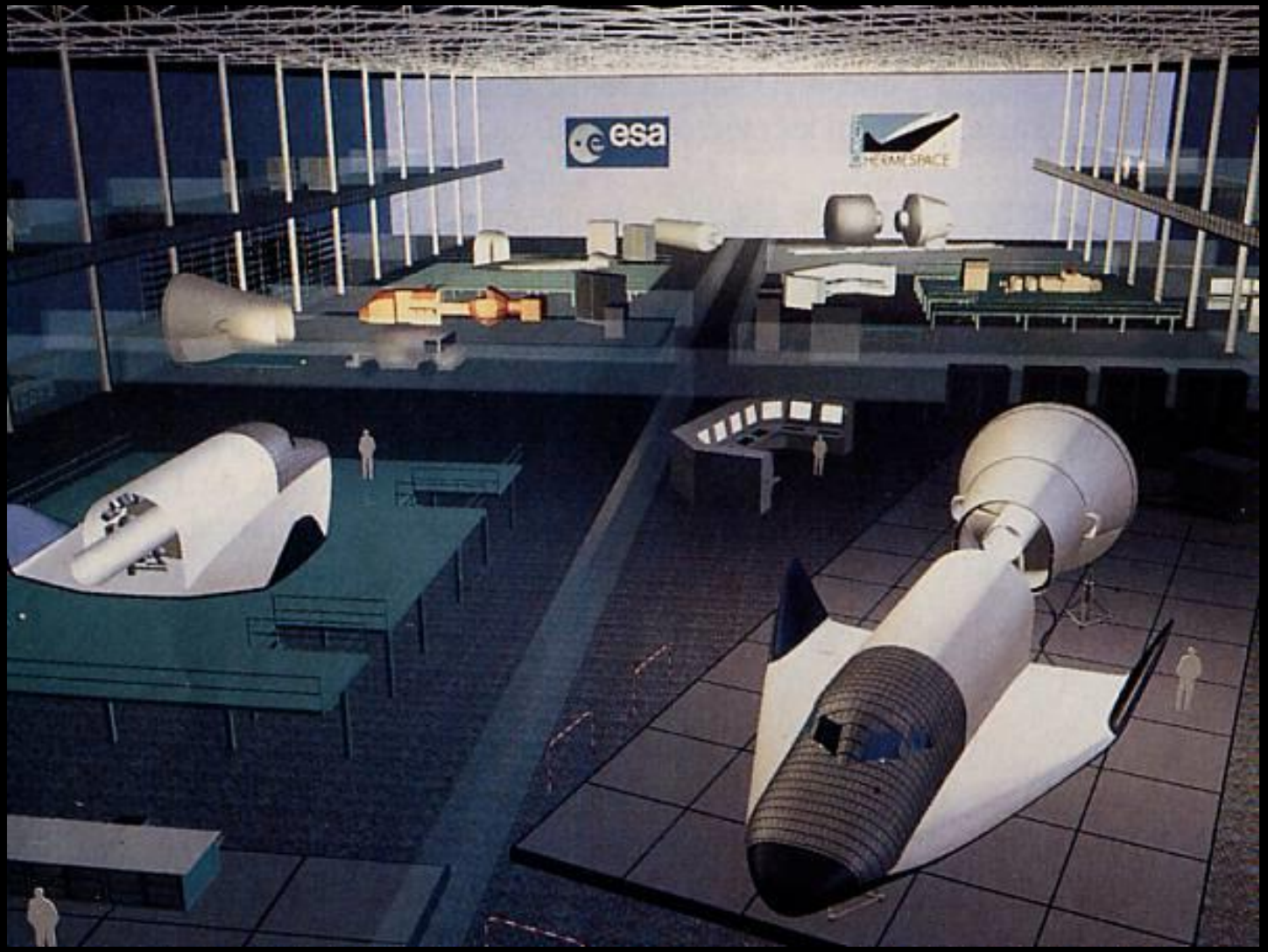
Náklady + 30 procent.

Srpen 1991



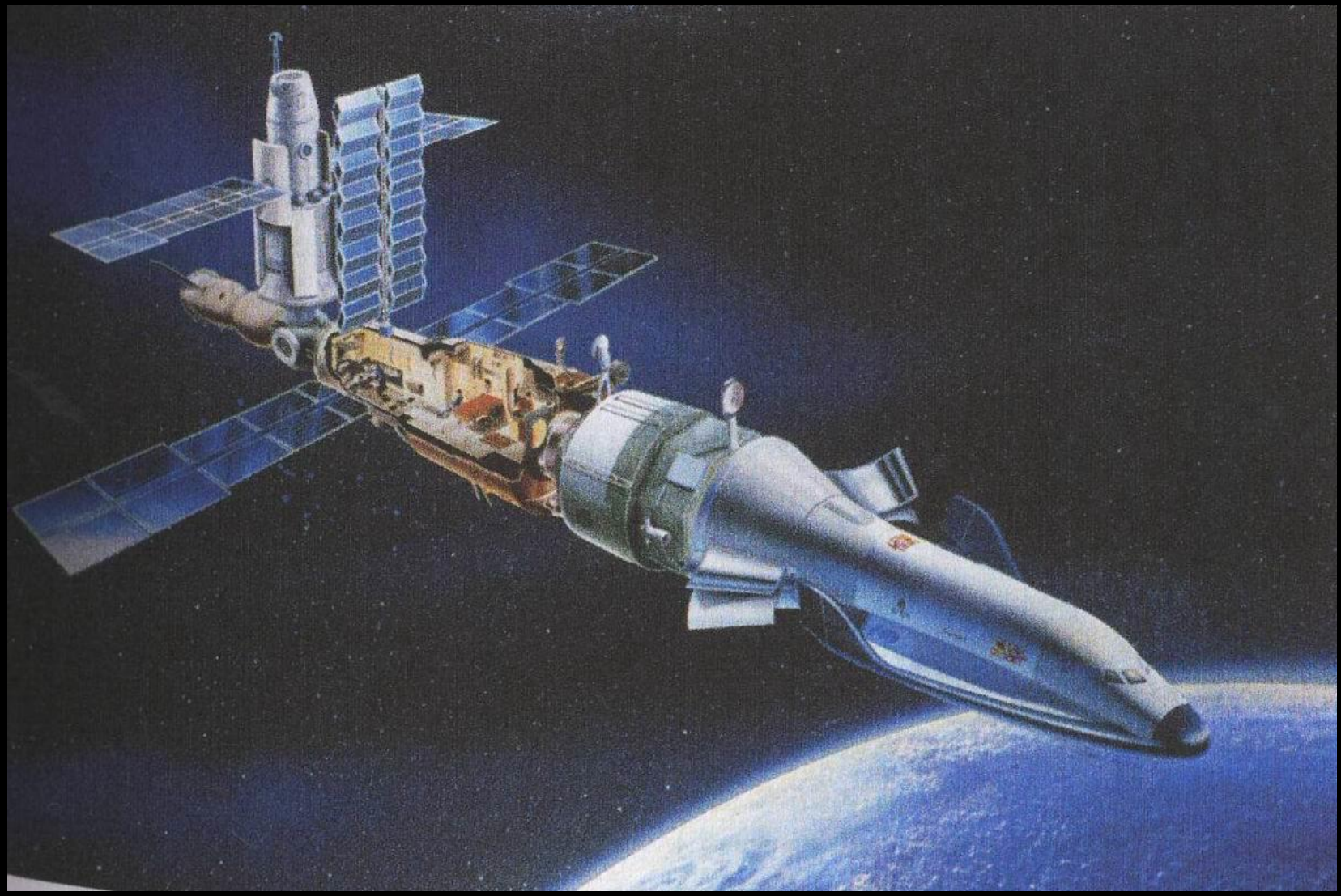
Premiéra 2002.

Listopad 1991



Odchází Norsko (0,2 procent).

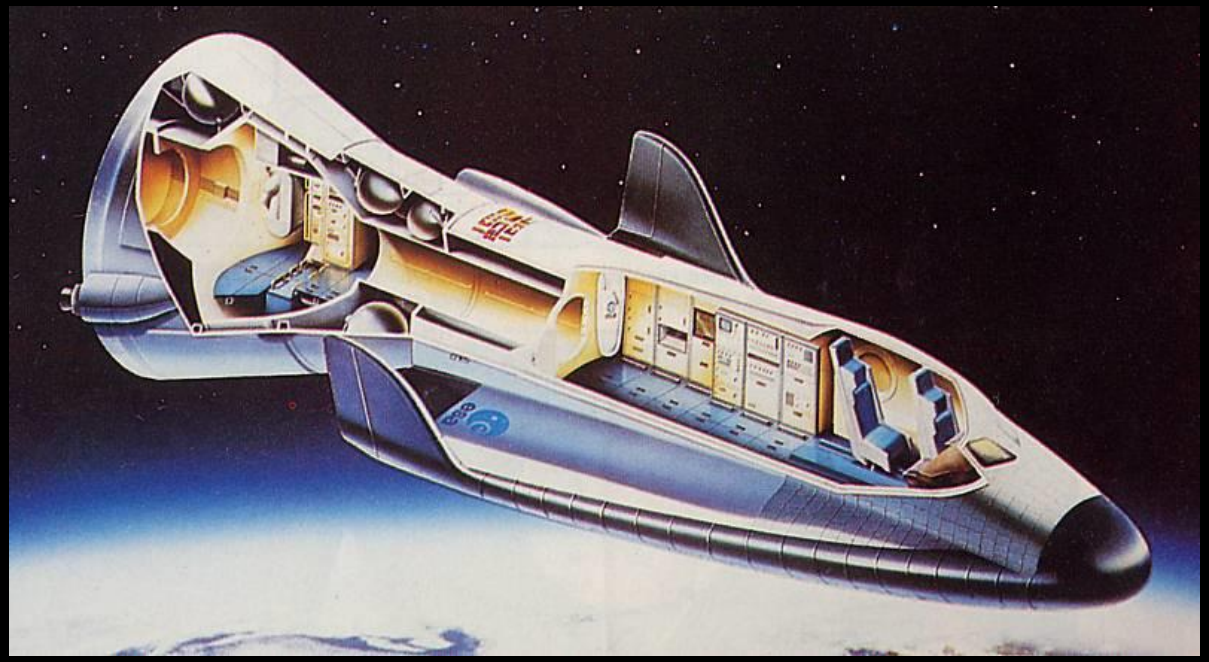
Duben 1992



Německo láká Rusko

Červenec 1992

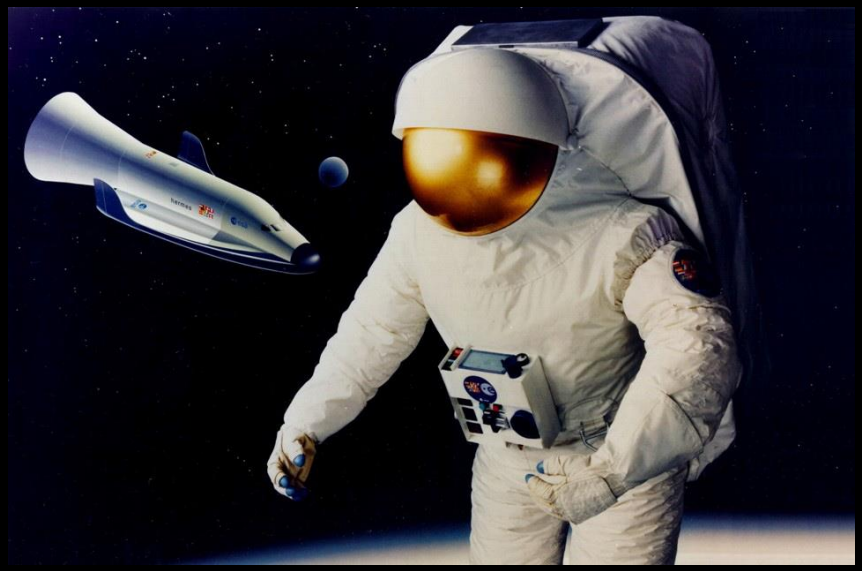
325 mil. USD,
o rok dříve
490 mil. USD

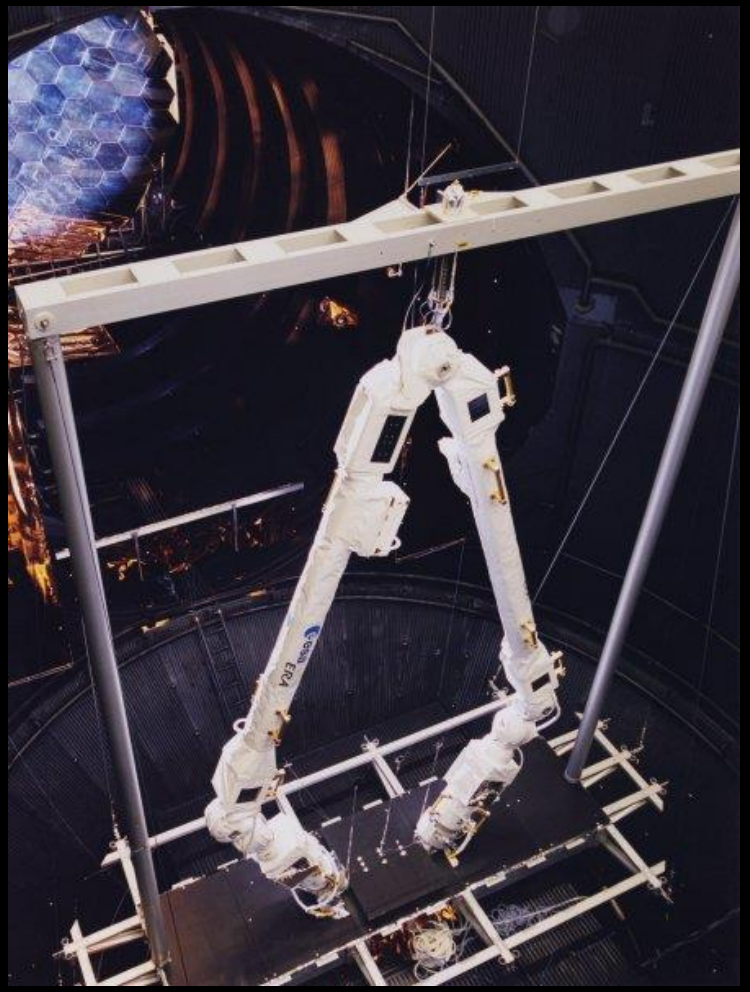


Září 1992

ESA se rozhoduje, že program přeorientuje.

9. a 10. listopadu 1992





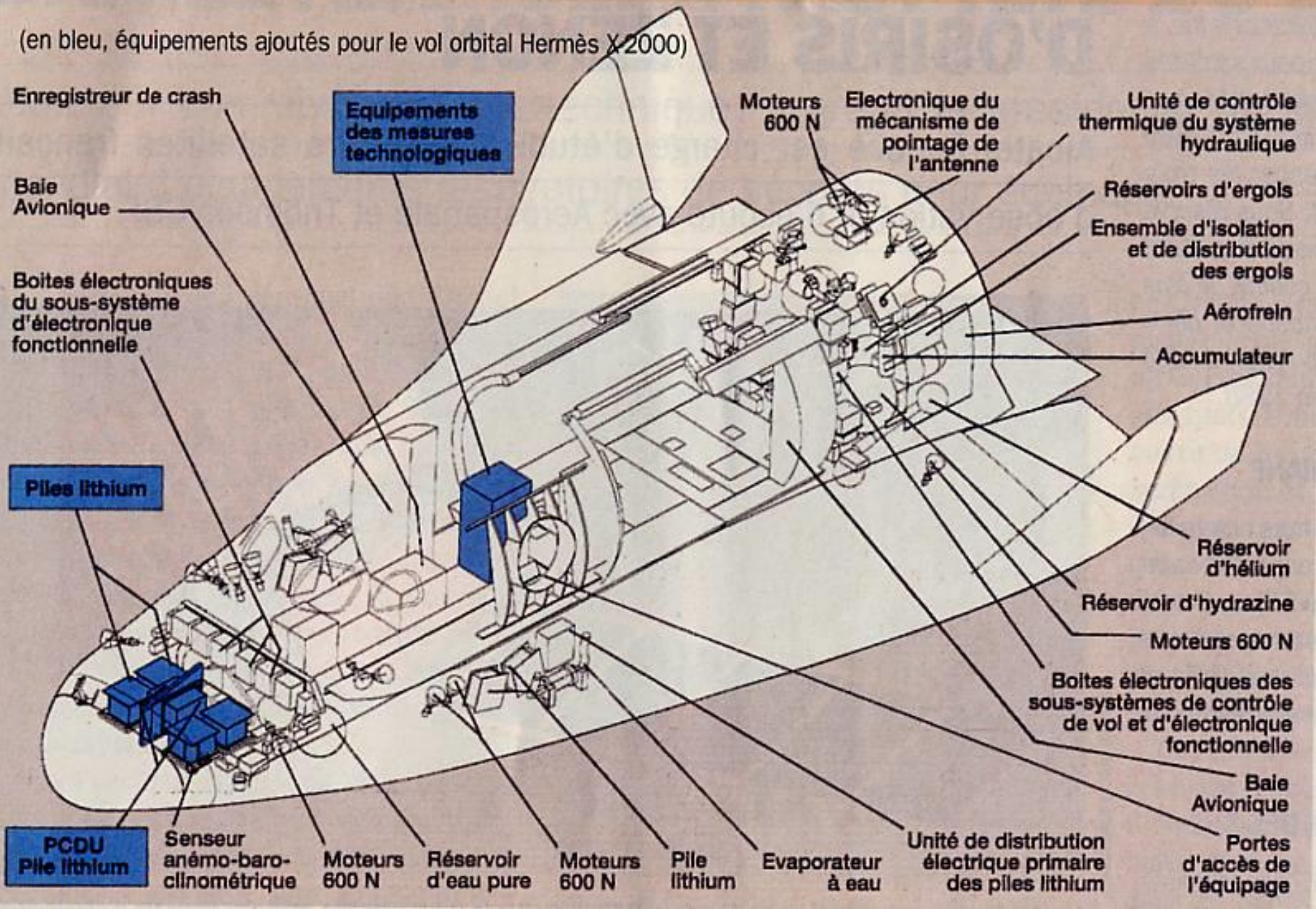
Granada: 120 mil. USD do spolupráce s Ruskem

EuroMir

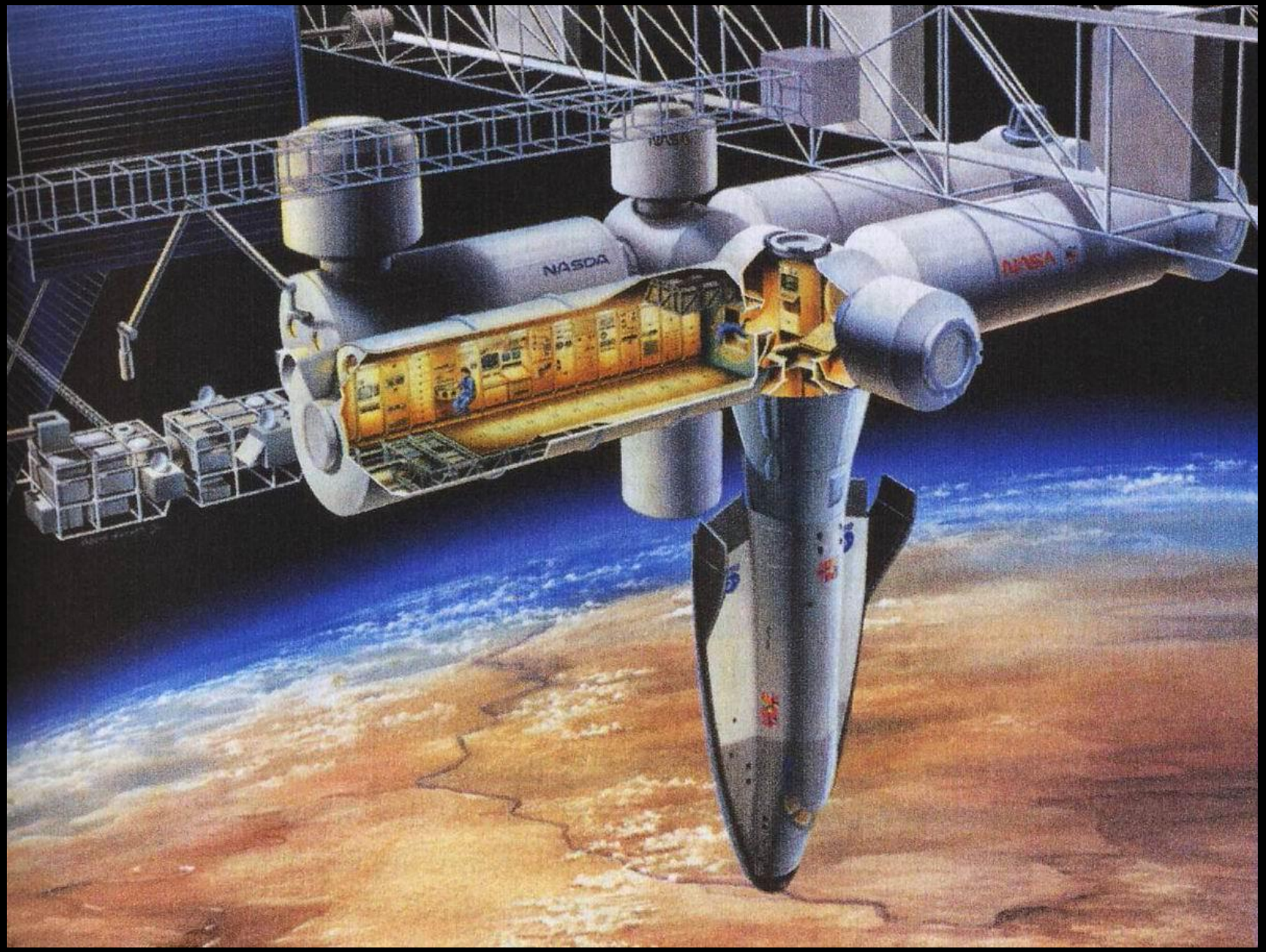
Týden, měsíc, půl roku.

LA NOUVELLE SILHOUETTE D'HERMES X-2000

(en bleu, équipements ajoutés pour le vol orbital Hermès X-2000)

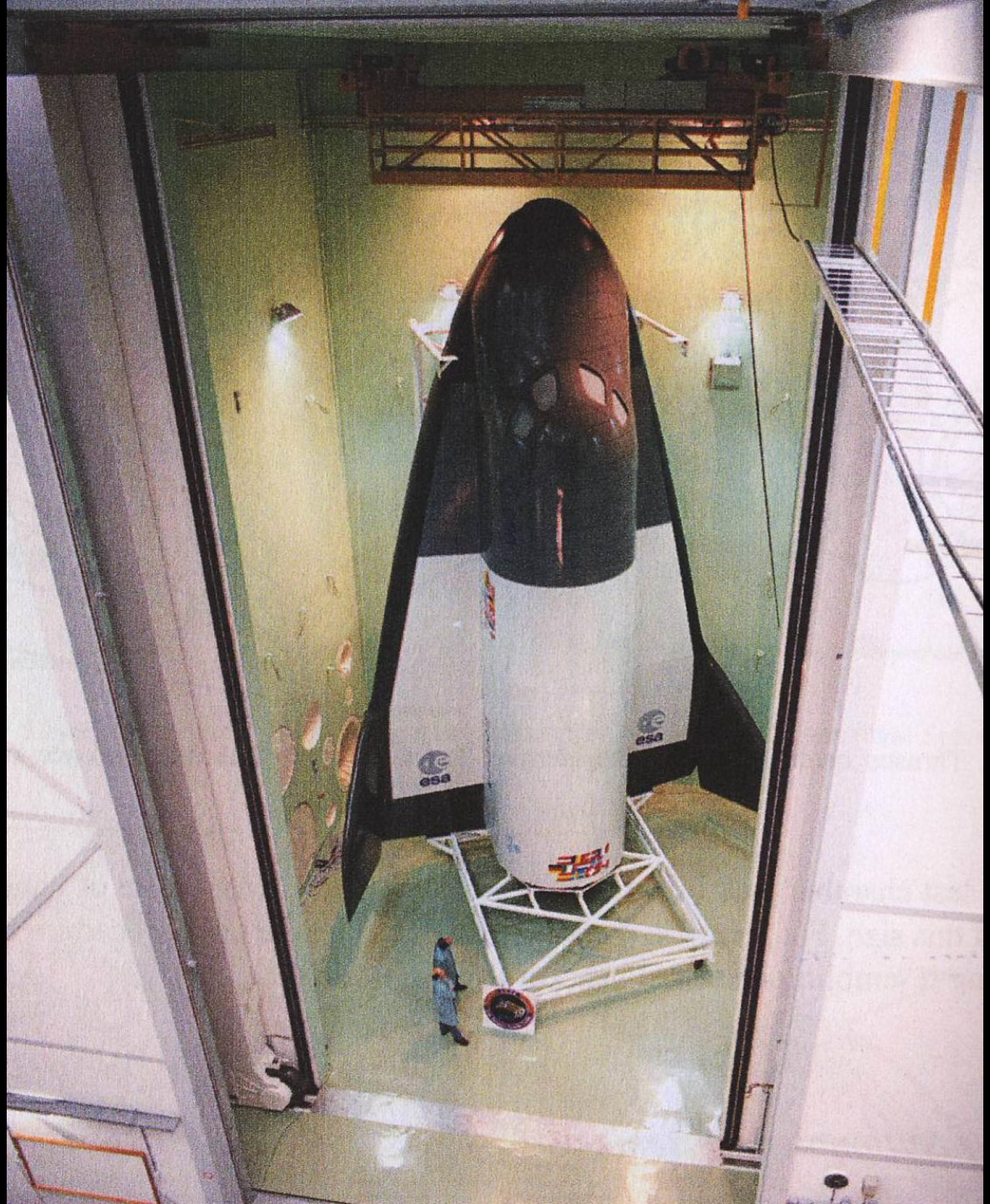


Srpen 2014



Co zbylo?


HERMES


esa
esa


esa
hermes

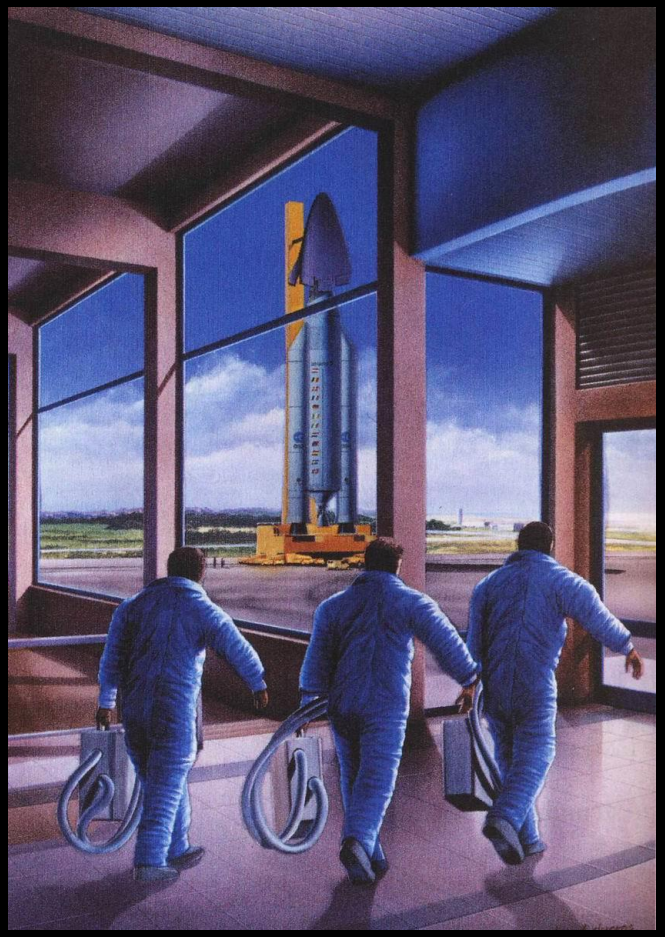

esa


esa
hermes

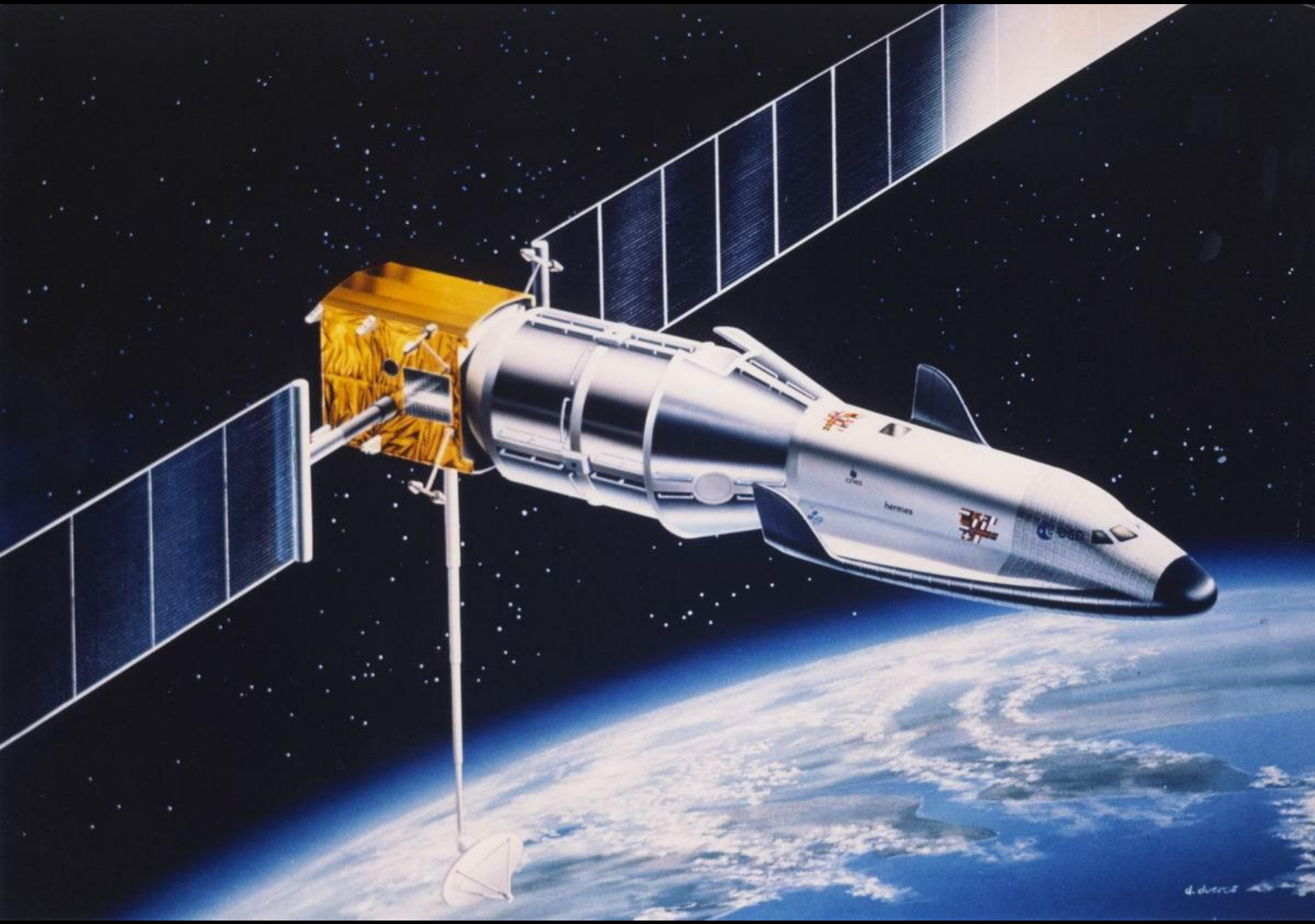

esa

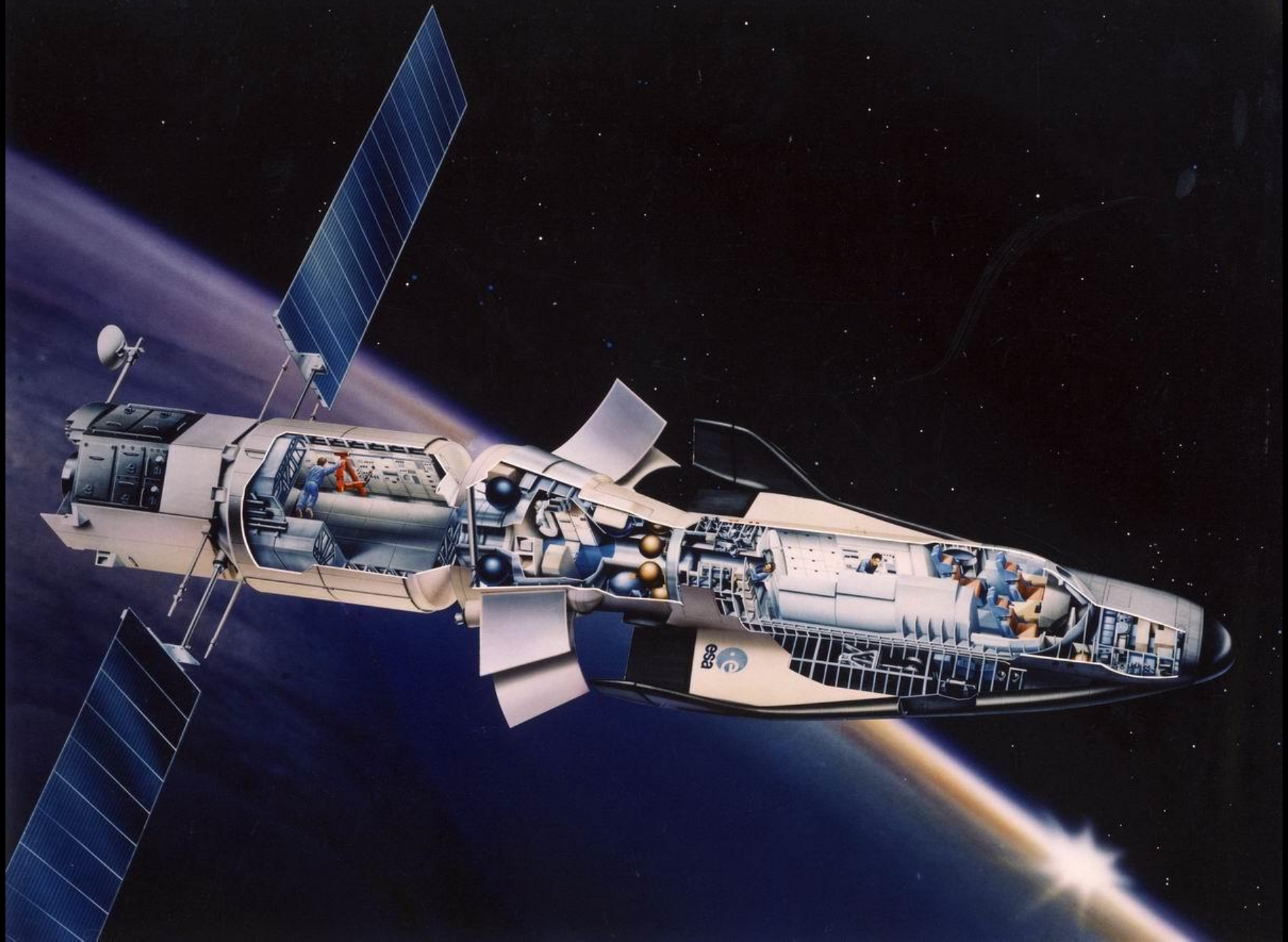

FLIGHT WARNING UNIT
FLIGHT GUID DISP
NAVIG DISP
MS WARNING DISP
NAVIG DISP
FLIGHT GUID DISP
MULTIFUNCK KEY BOARD
GUID MT
SYST CONFIG DISP
GUID MT
MULTIFUNCK KEY BOARD
FLIGHT CONTR SYST PANEL
LAUNCH
CONTR PAN
FCR USE
CAB CP
OXYGEN
LANDING GEAR
PROT SEMIDOR
TELECOM
TRIM
LIGHT TUBE
DATA LINK
LIFE SUP PAN

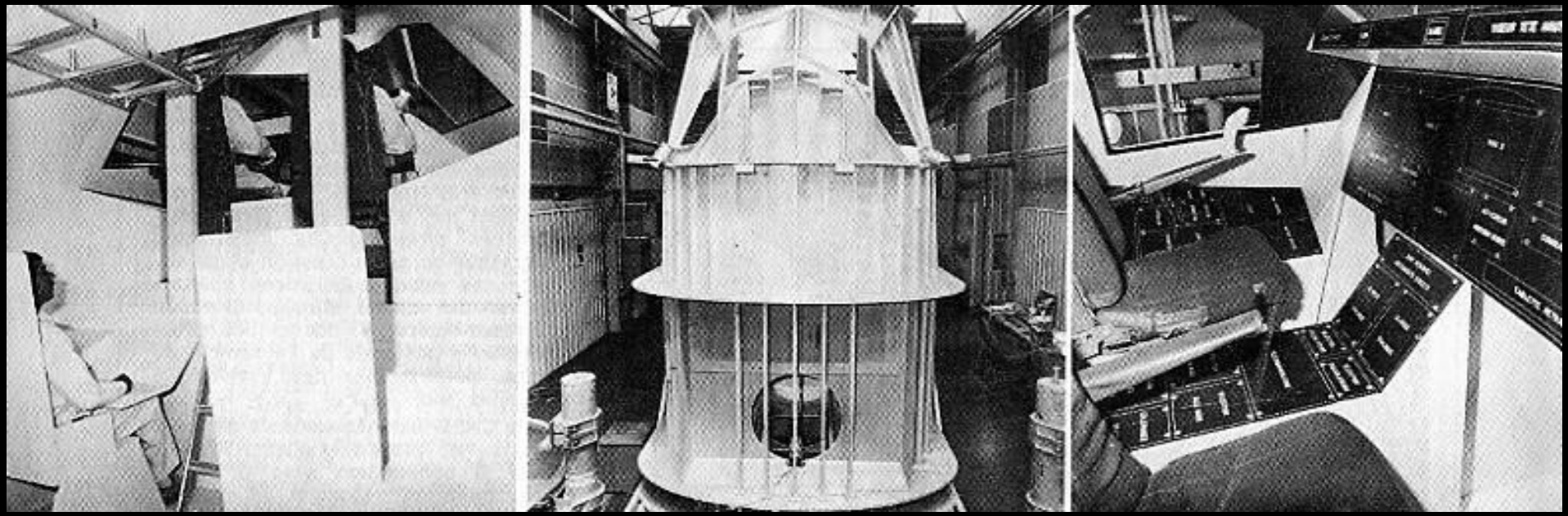
Děkuji za pozornost!

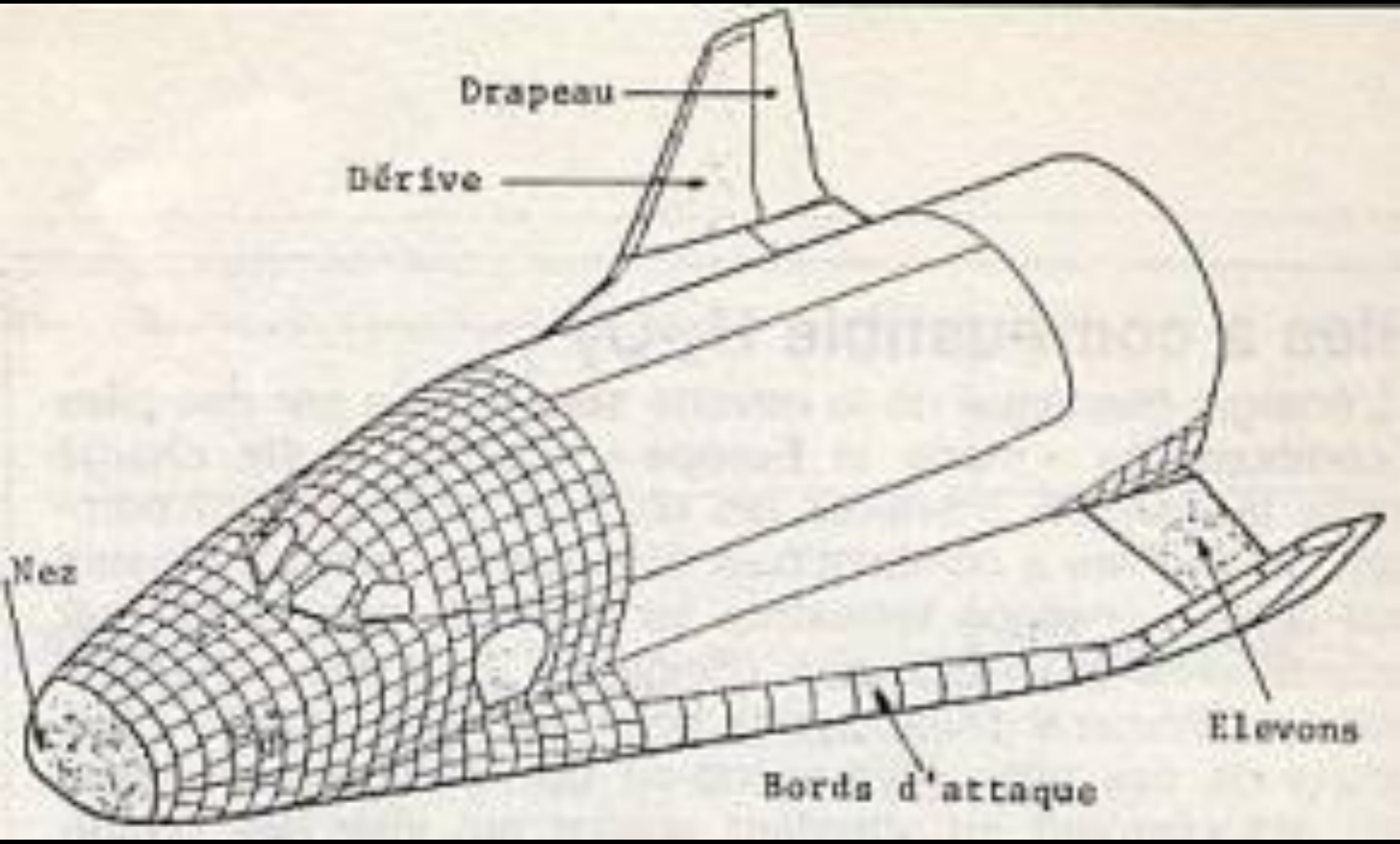


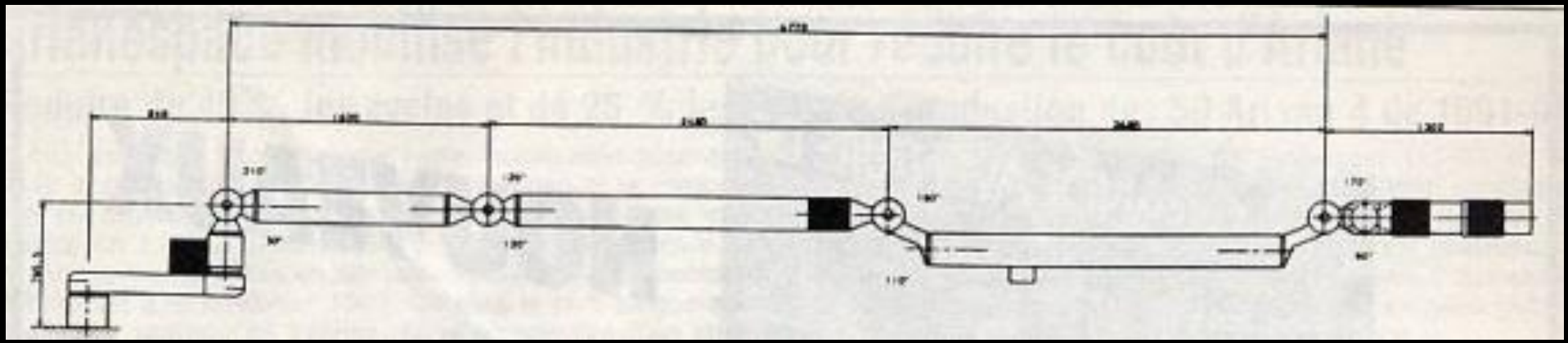
Ing. Tomáš PŘIBYL
tomas.pribyl@seznam.cz
www.kosmonaut.cz

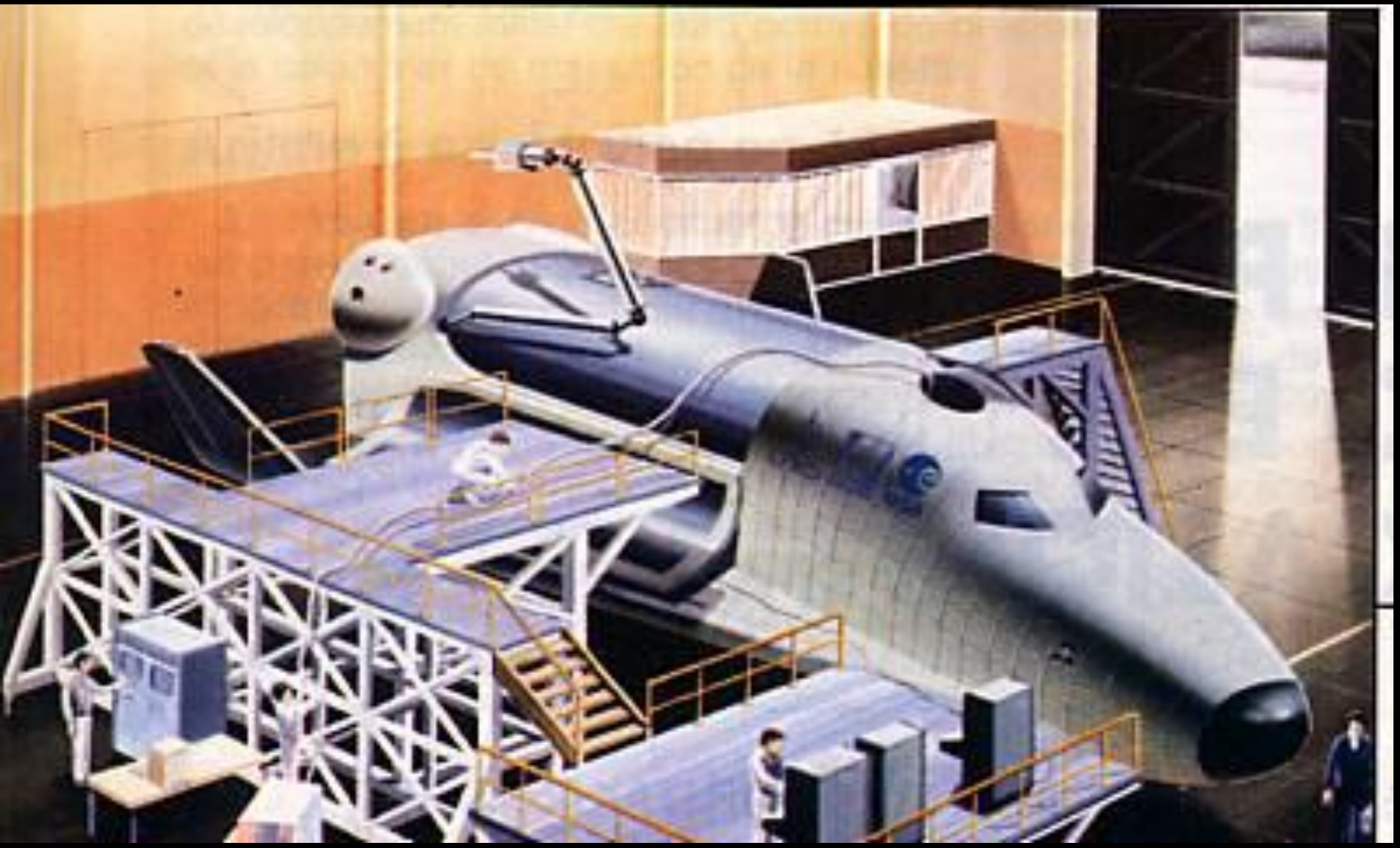

ohes
hermes



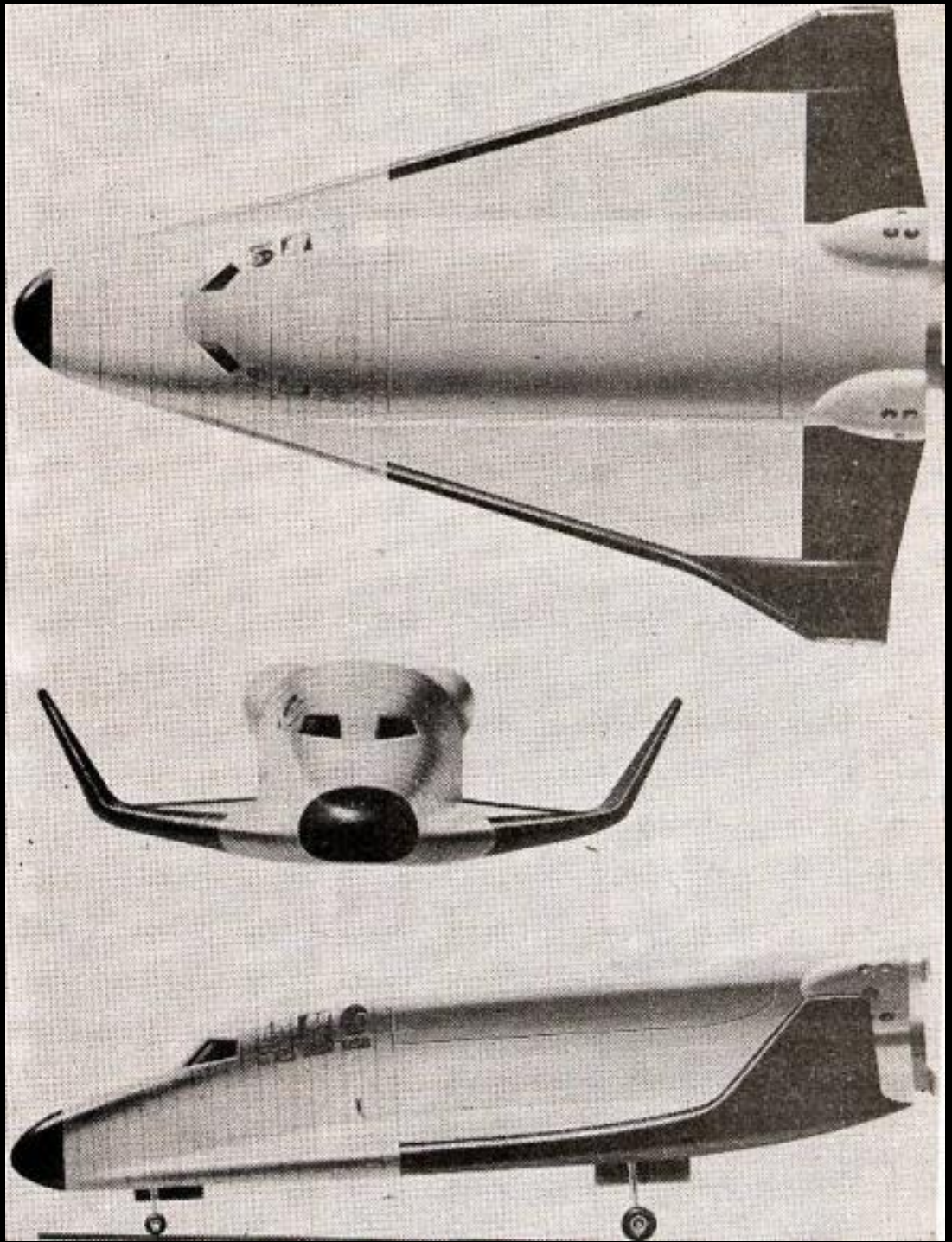


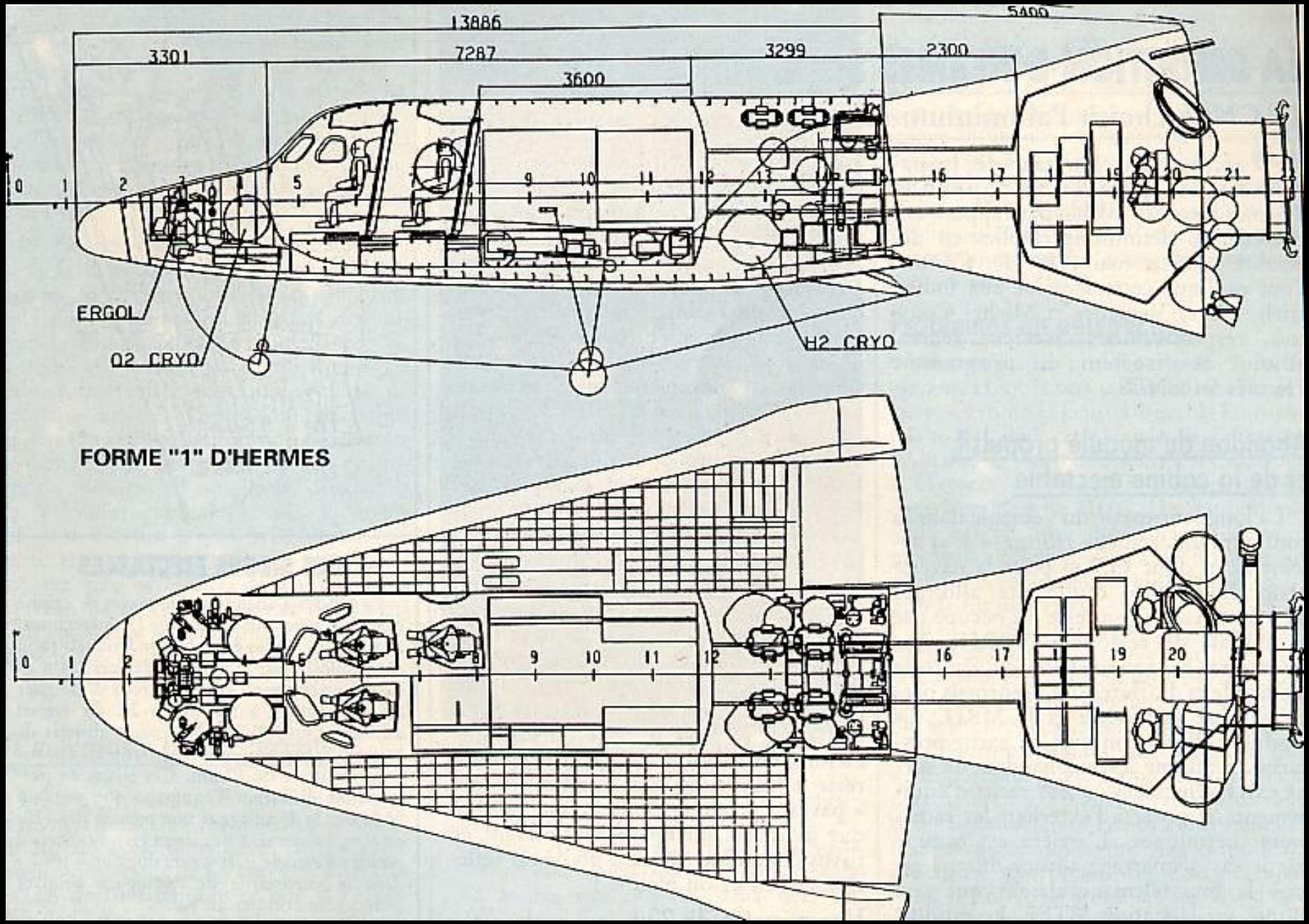

Drapeau
Dérive
Nez
Elevons
Bords d'attaque

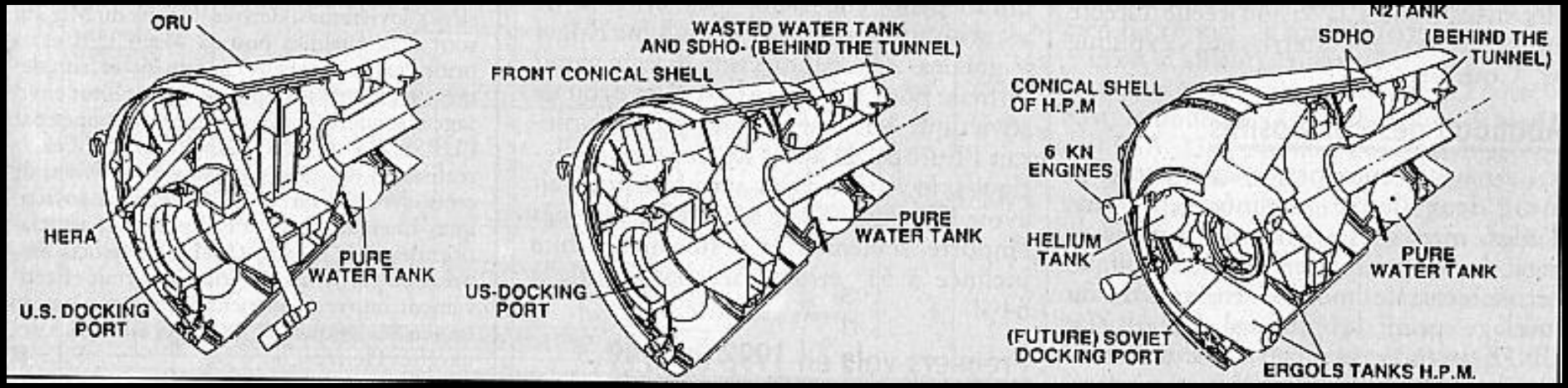


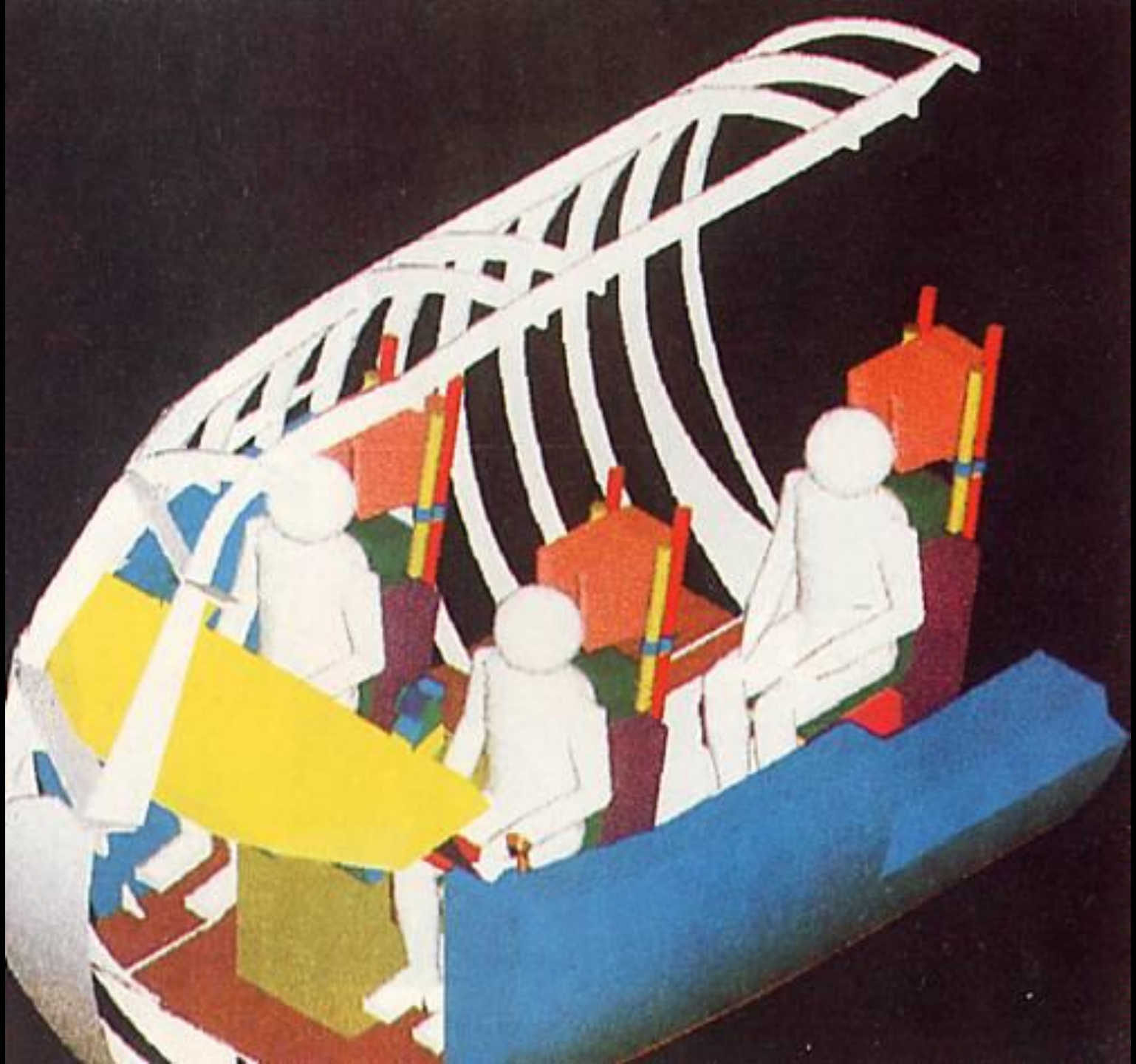


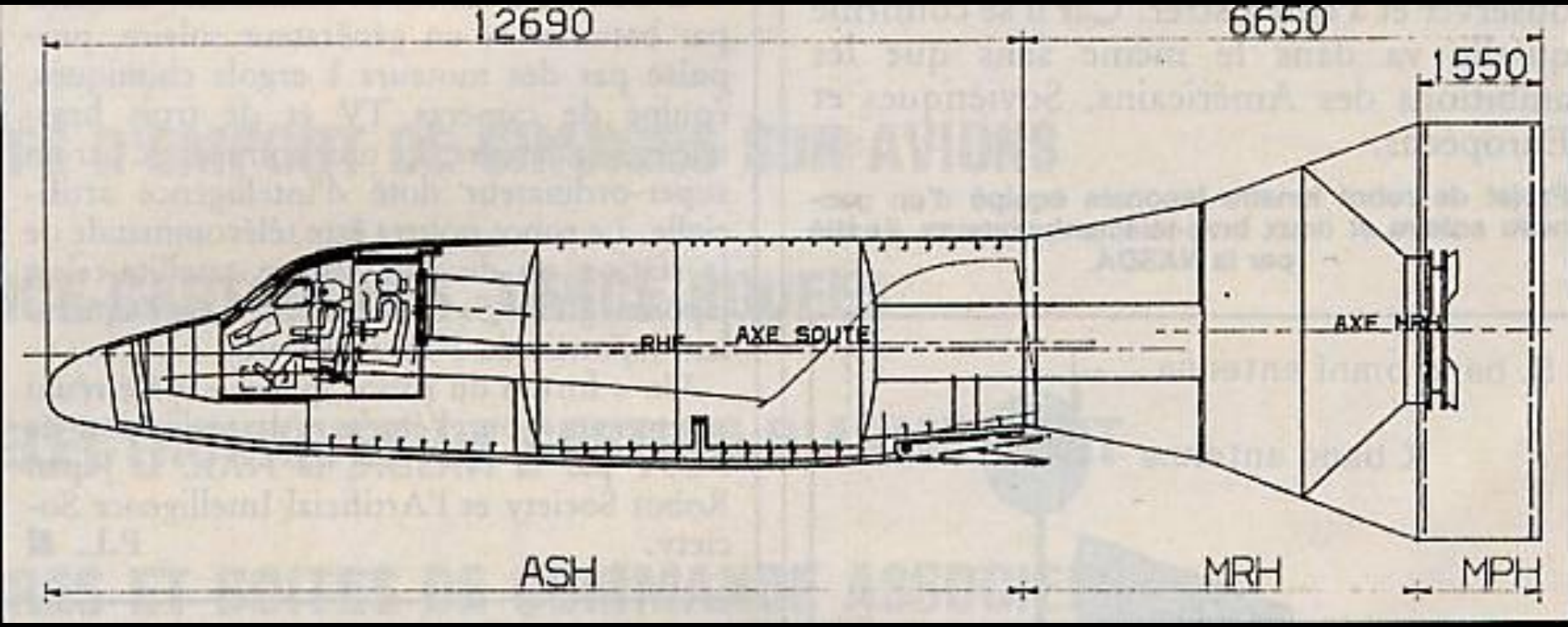

esa
ariane

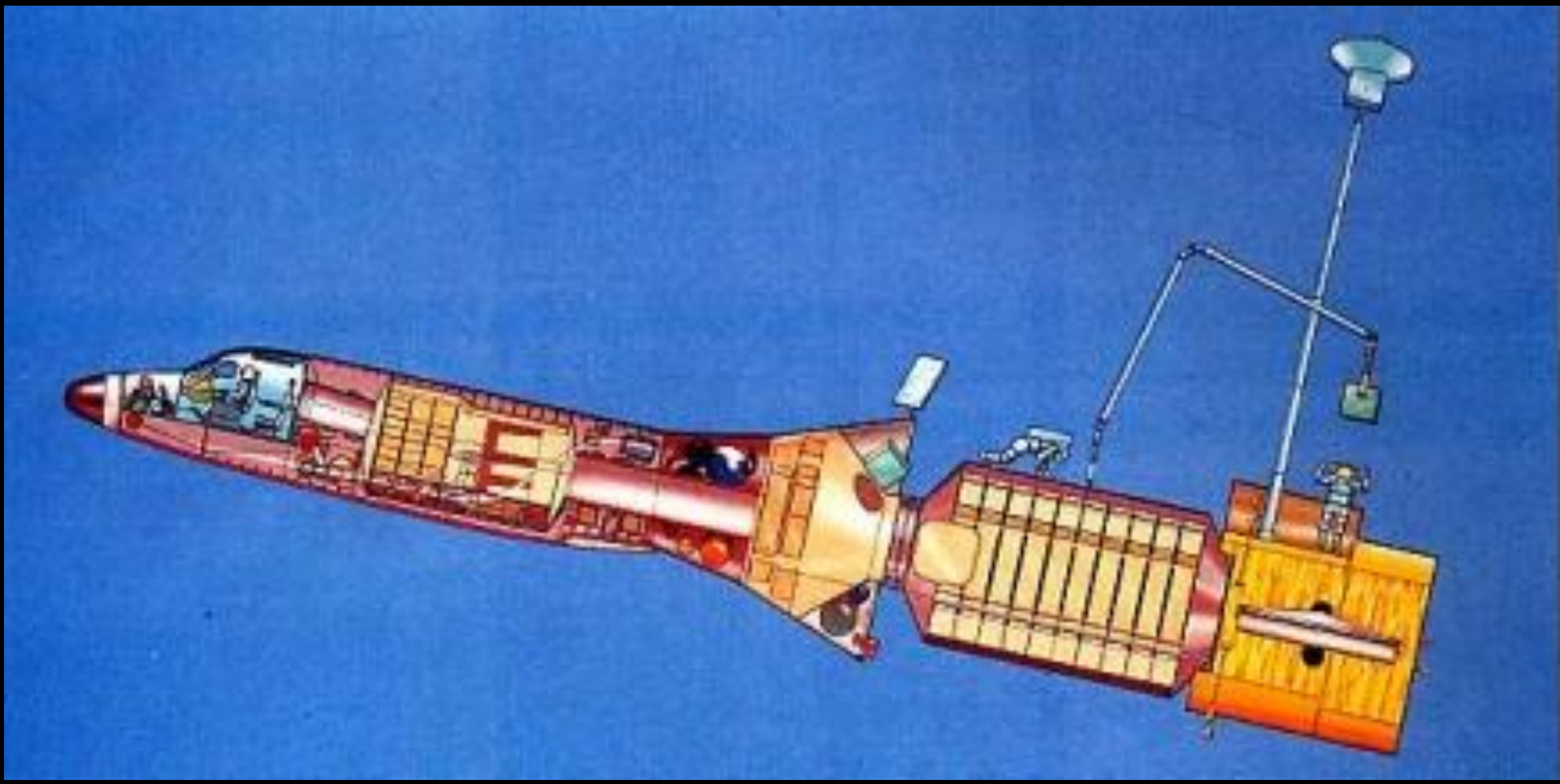


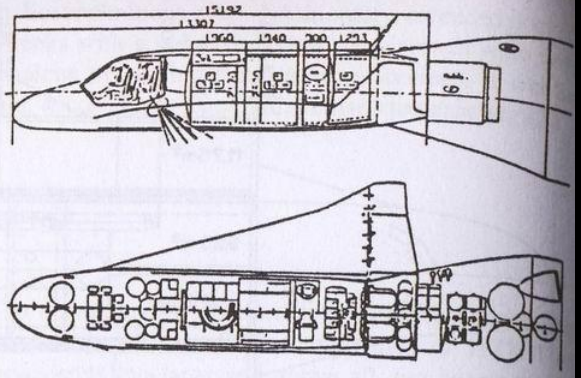

13886
5400
3301
7287
3299
2300
3600
0
1
2
3
5
9
10
11
12
13
16
17
19
20
21
ERGOL
O2 CRYO
H2 CRYO
FORME "1" D'HERMES


ORU
HERA
PURE
WATER TANK
U.S. DOCKING
PORT
WASTED WATER TANK
AND SDHO- (BEHIND THE TUNNEL)
FRONT CONICAL SHELL
PURE
WATER TANK
US-DOCKING
PORT
N2TANK
SDHO
(BEHIND THE
TUNNEL)
CONICAL SHELL
OF H.P.M
6 KN
ENGINES
HELIUM
TANK
PURE
WATER TANK
(FUTURE) SOVIET
DOCKING PORT
ERGOLS TANKS H.P.M.

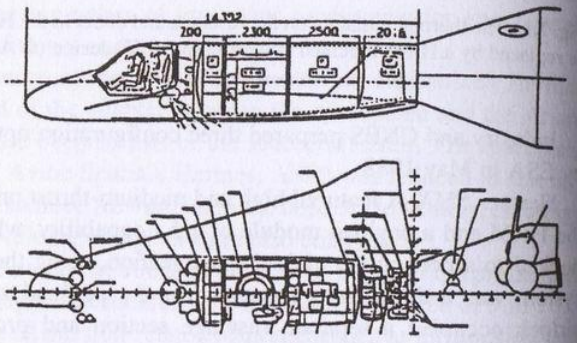



12690
6650
1550
RHF
AXE SOUTE
AXE MRH
ASH
MRH
MPH

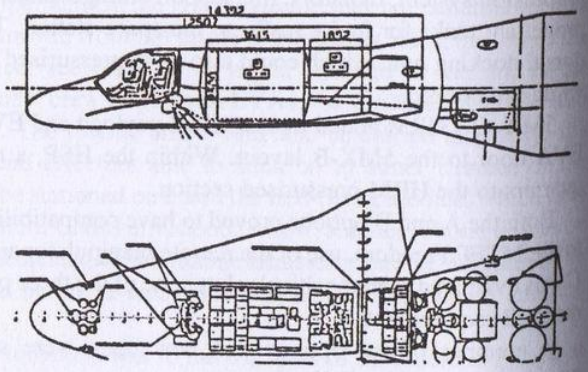




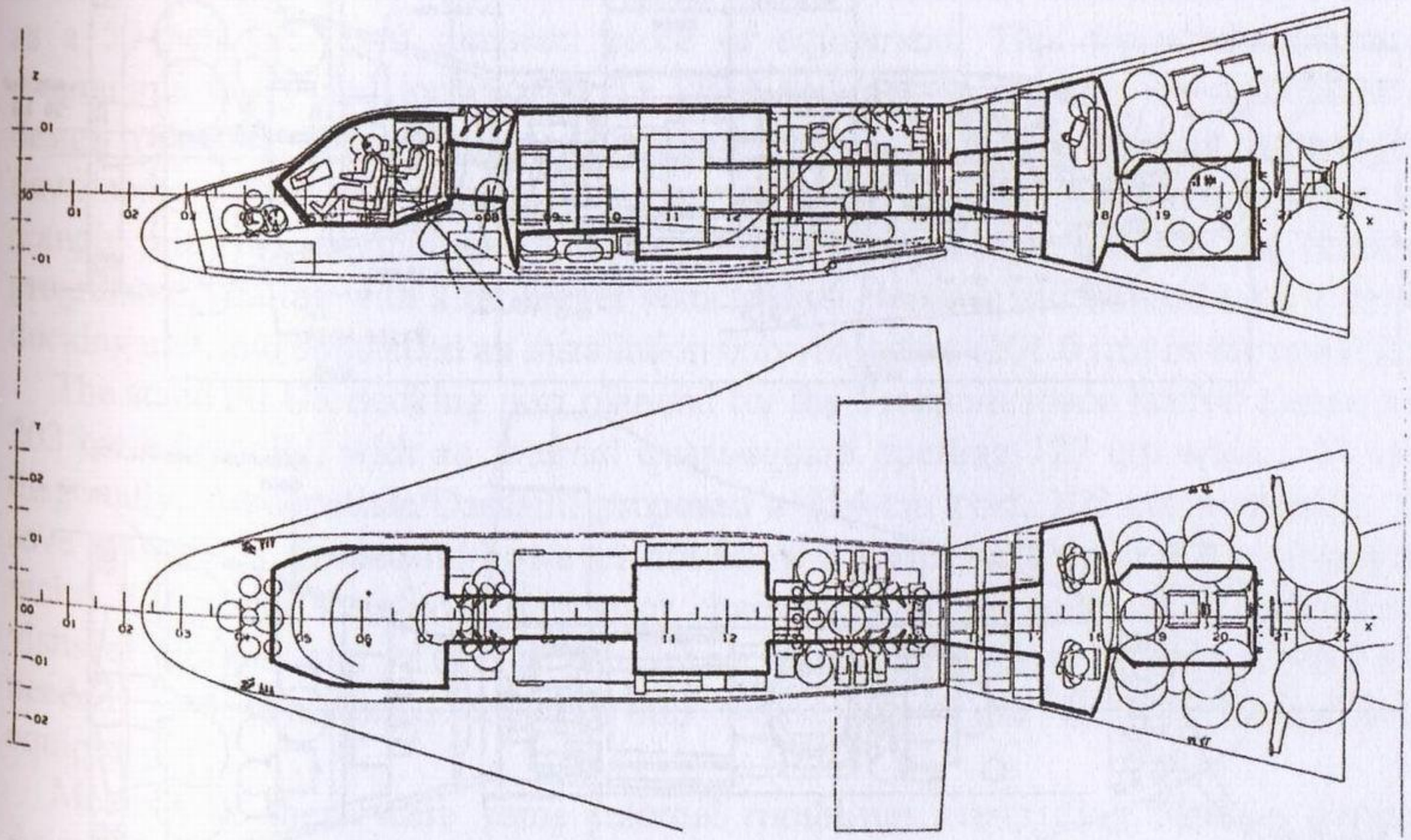
5MX-A LAYOUT

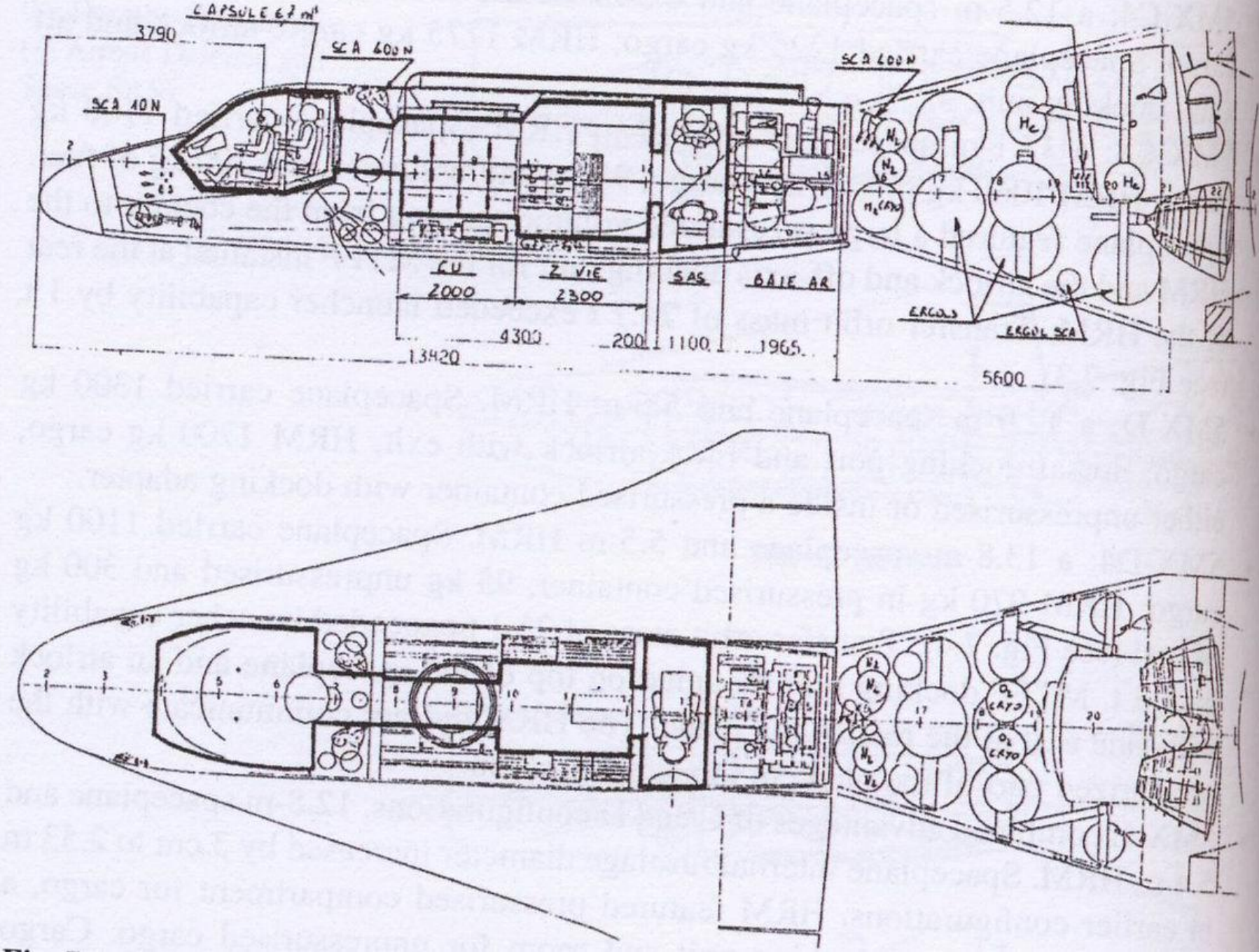


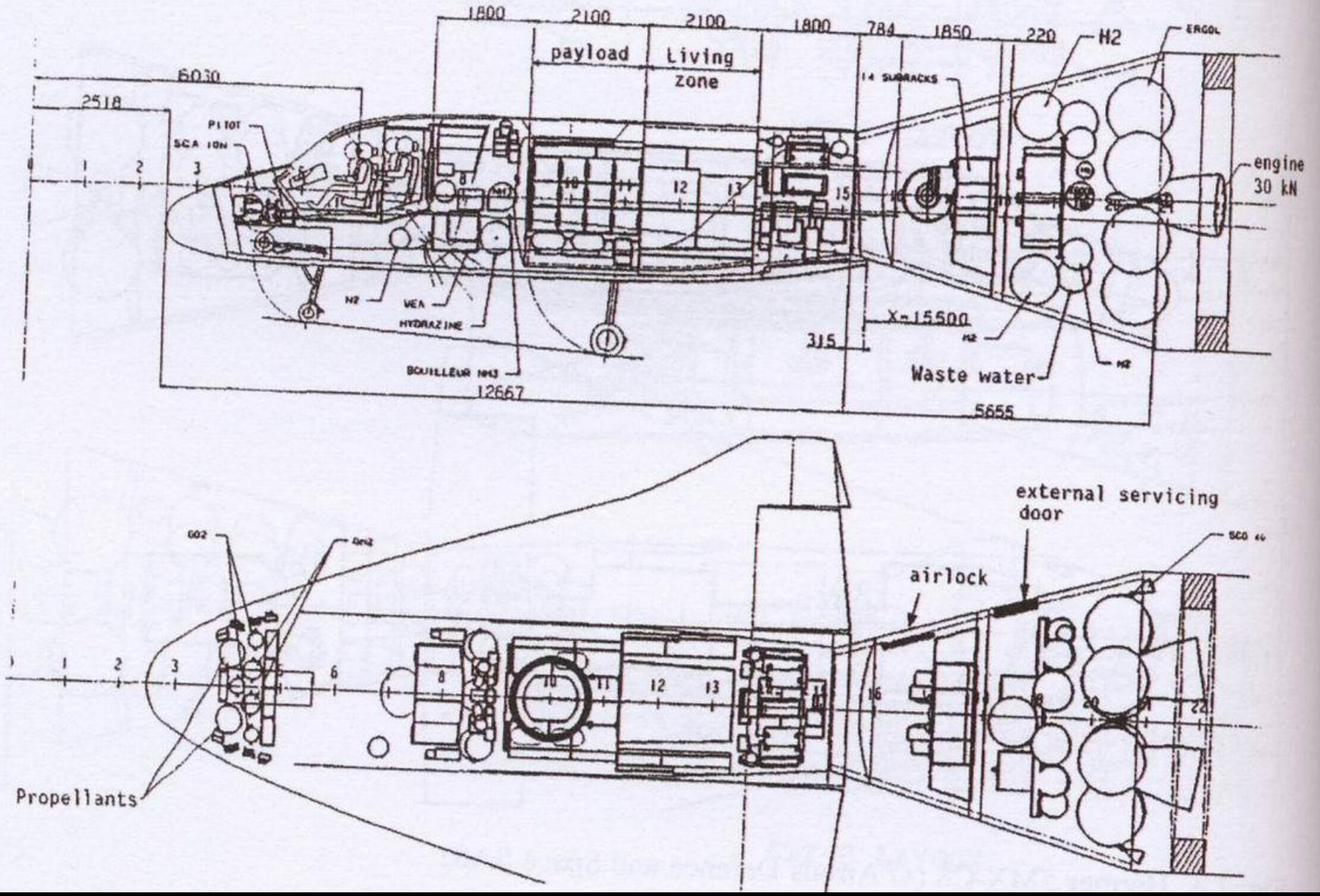
5MX-B LAYOUT

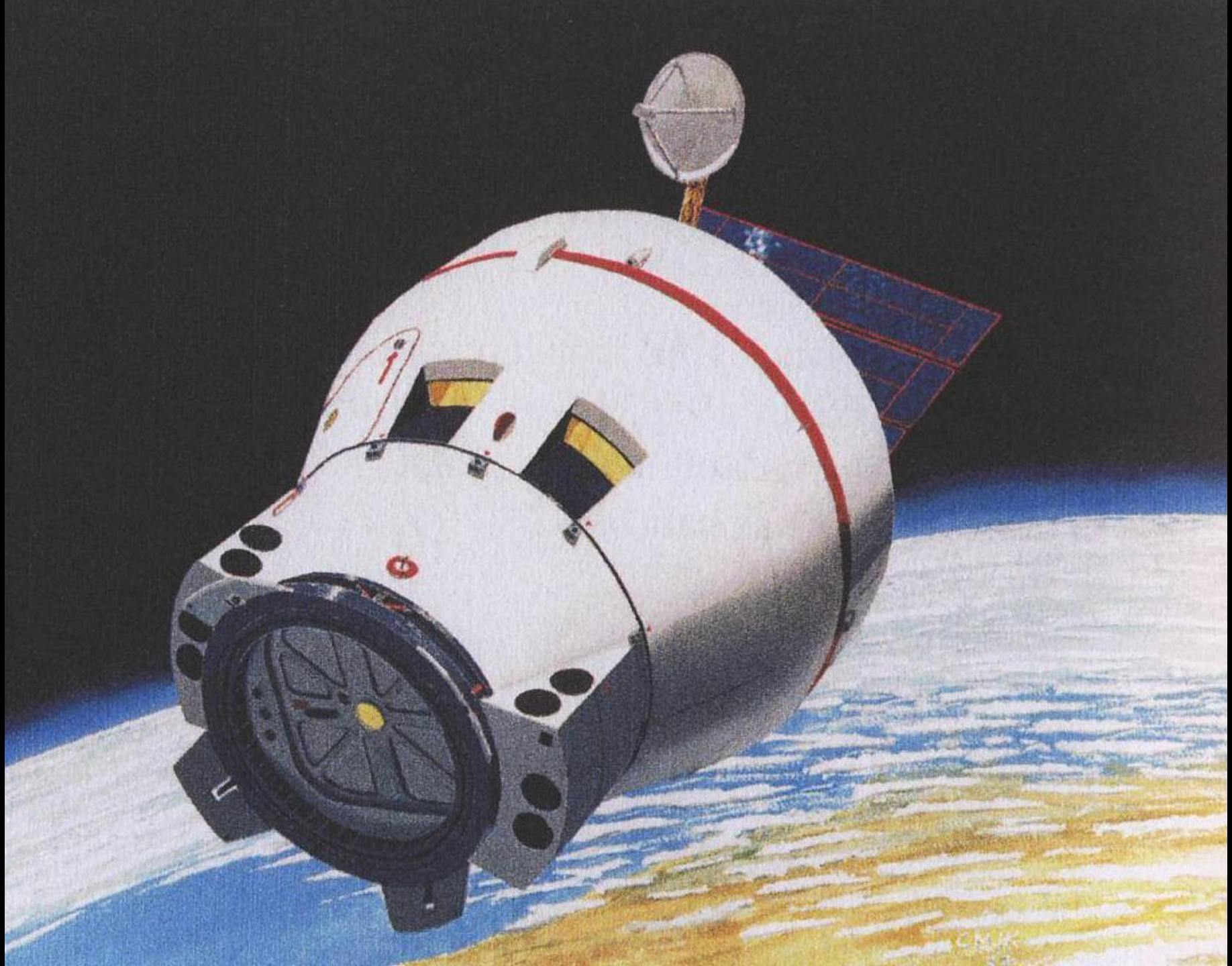


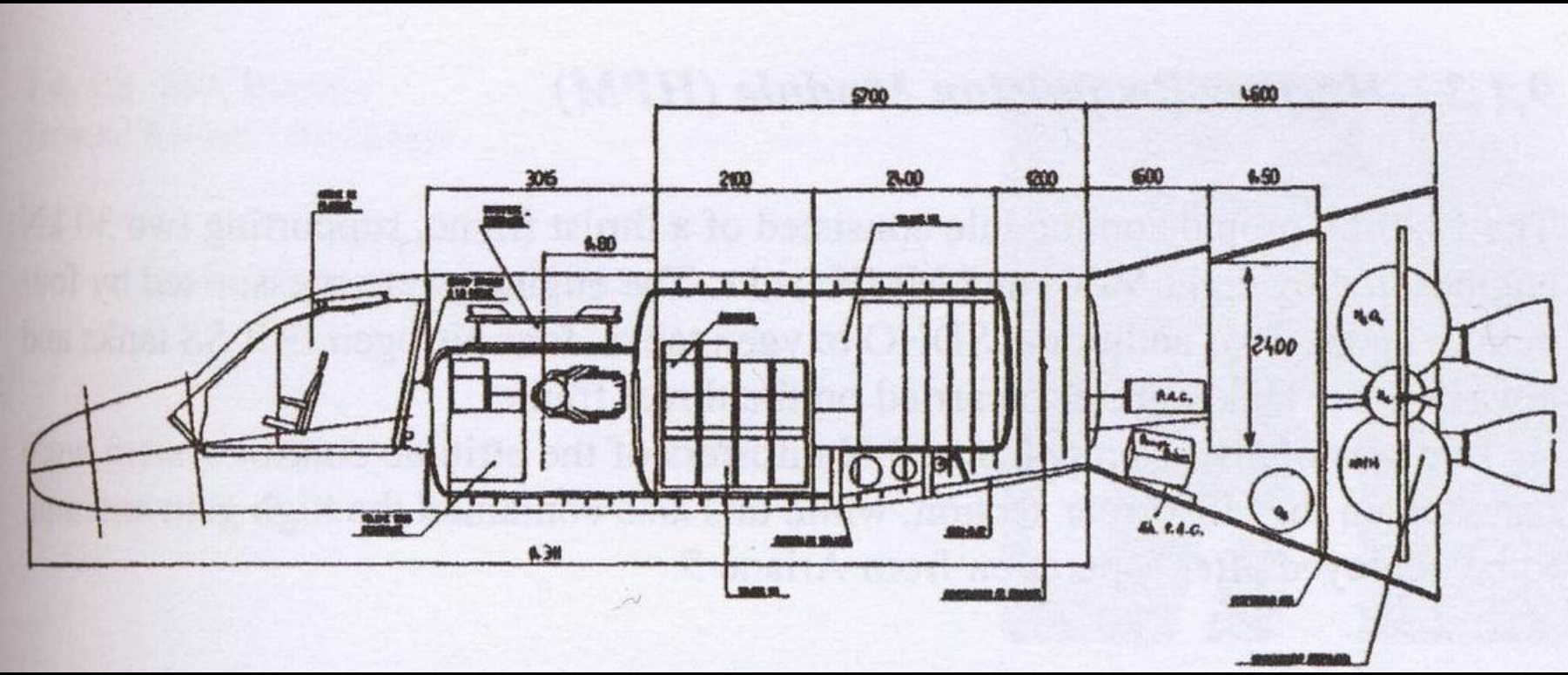
5MX-C LAYOUT

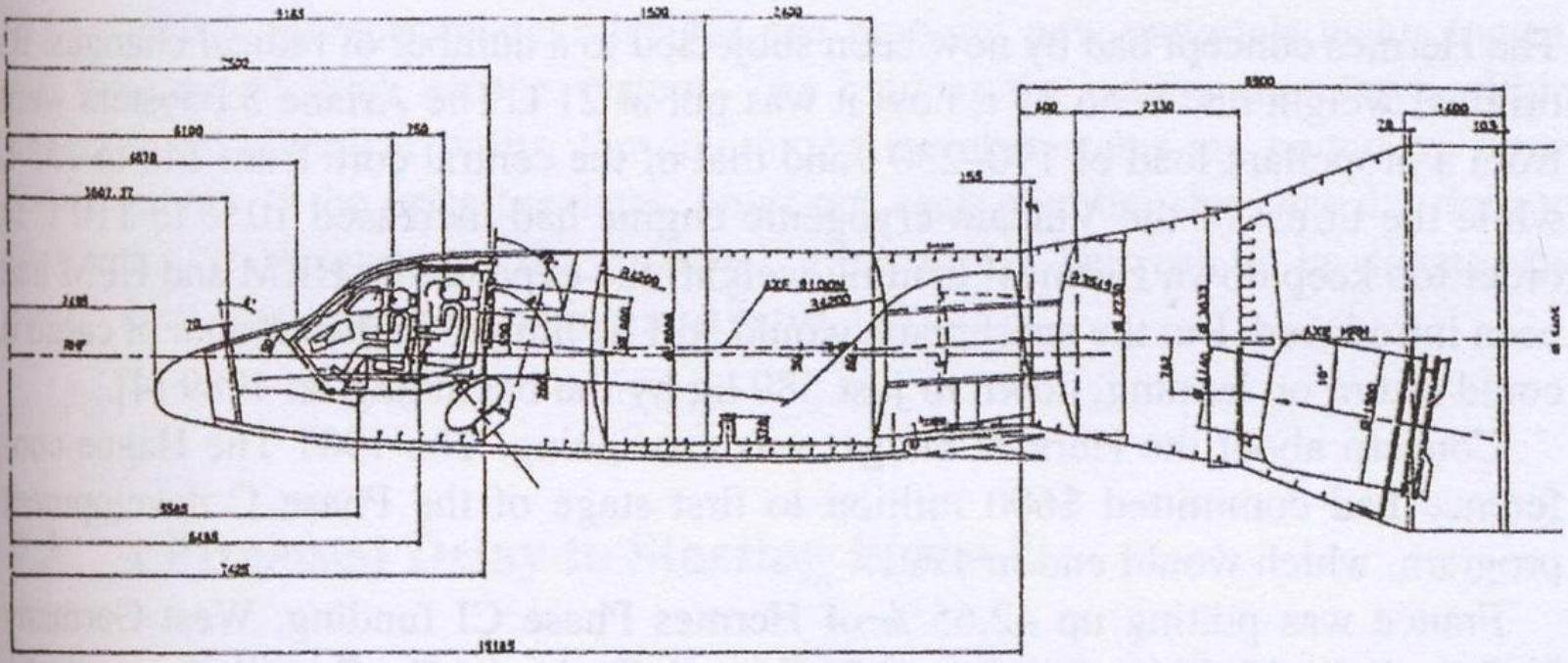


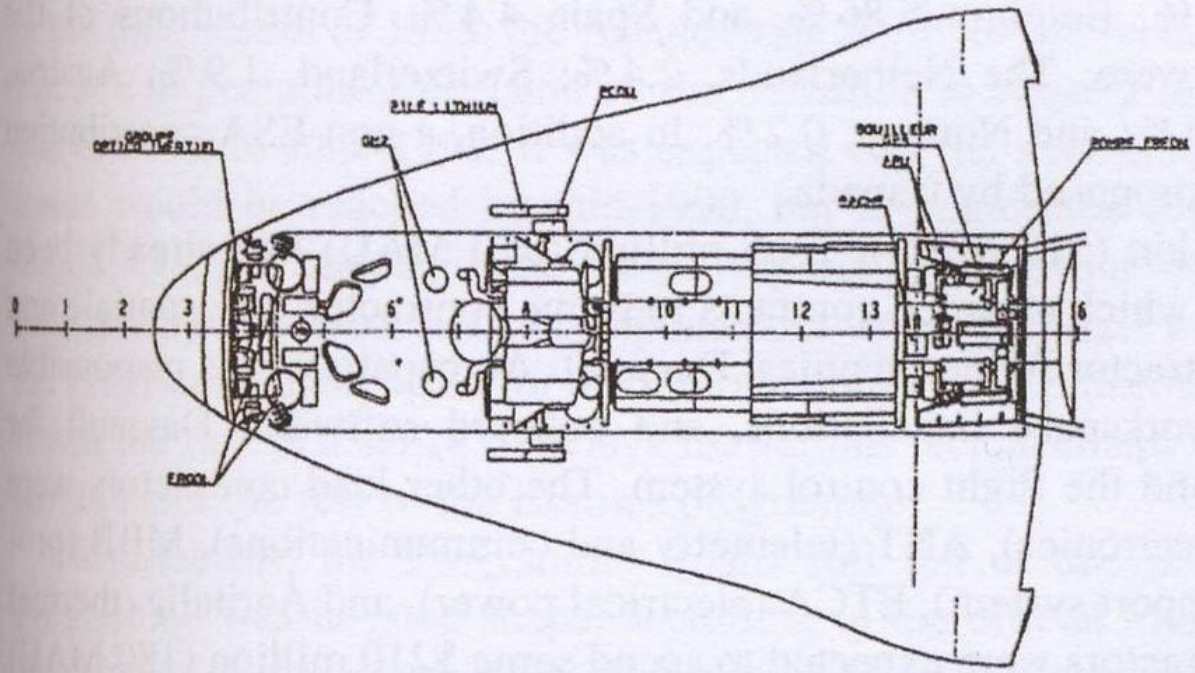

CAPSULE 6,7 m³
3790
SCA 60 N
SCA 10 N
SCA 60 N
CU
2000
2 VIE
2300
SAS
BAIE AR
4300
200
1100
1965
13420
ERCOL
ERCOL SCA
5600

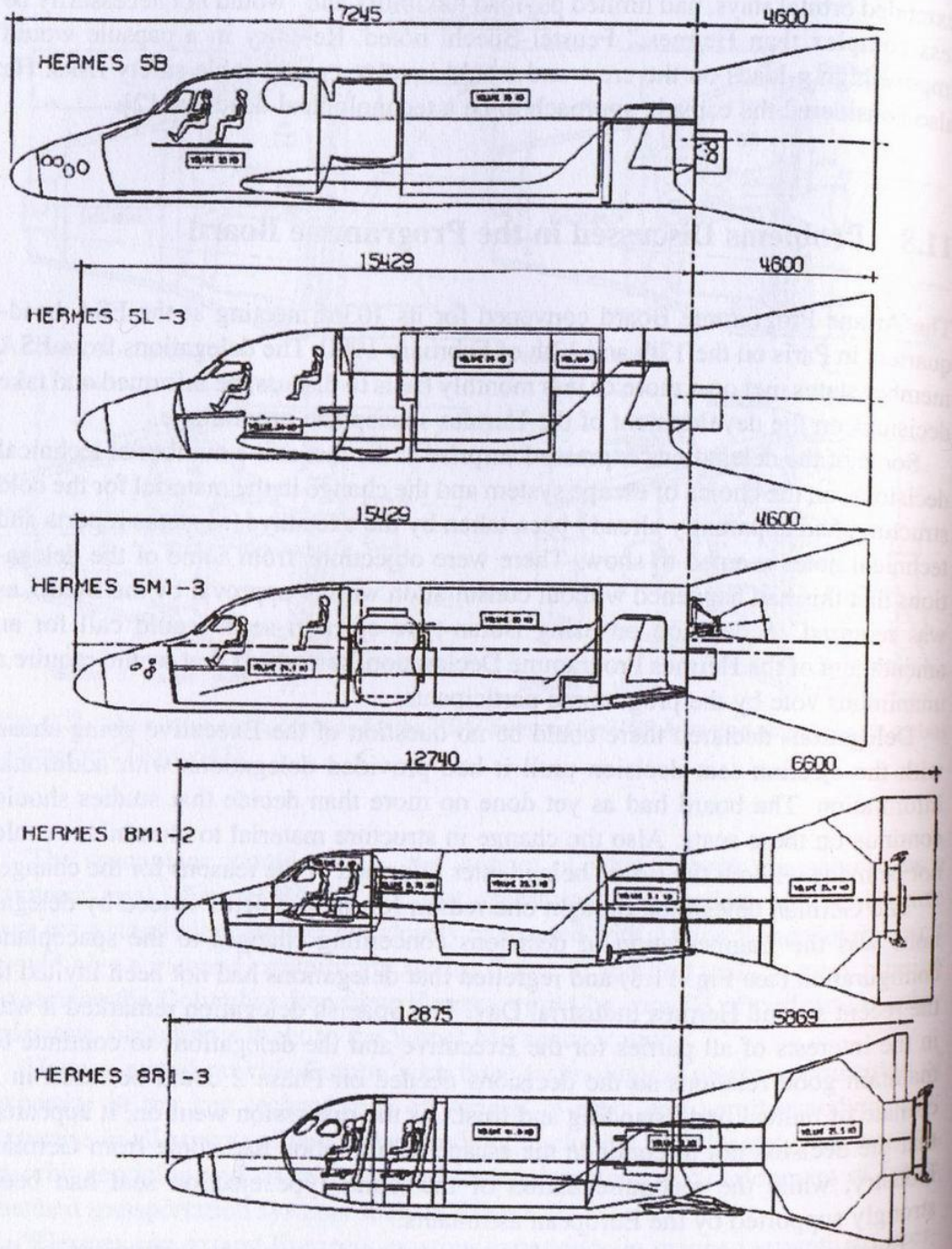

1800
2100
2100
1800
784
1850
220
payload
Living zone
H2
ERCOL
6030
2518
PITOT
SCA ION
14 SUBRACKS
engine 30 kN
X=15500
315
Waste water
12667
5655
external servicing door
airlock
Propellants



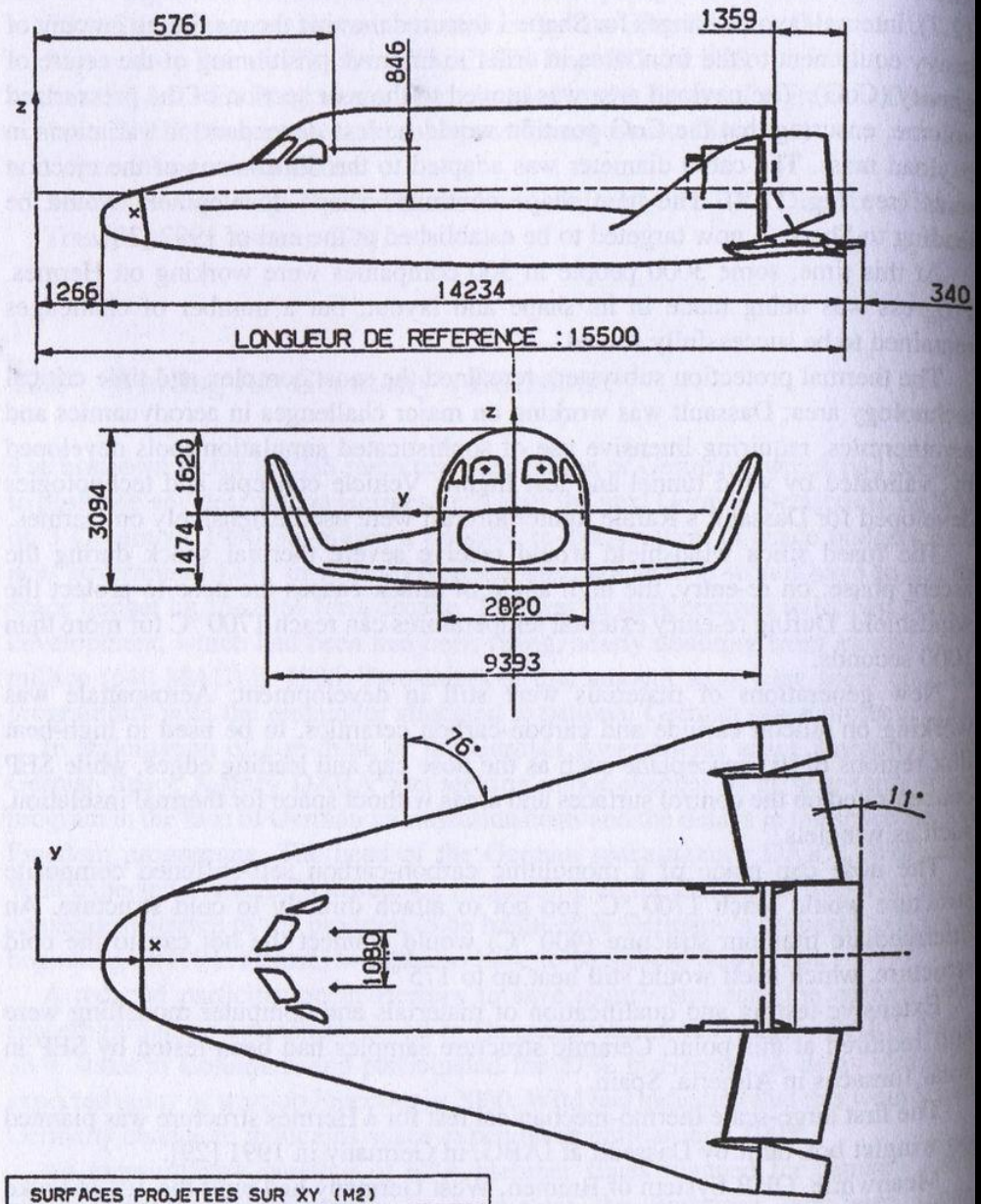

5700
4600
305
2100
2400
900
600
450
480
2400
R.A.C.



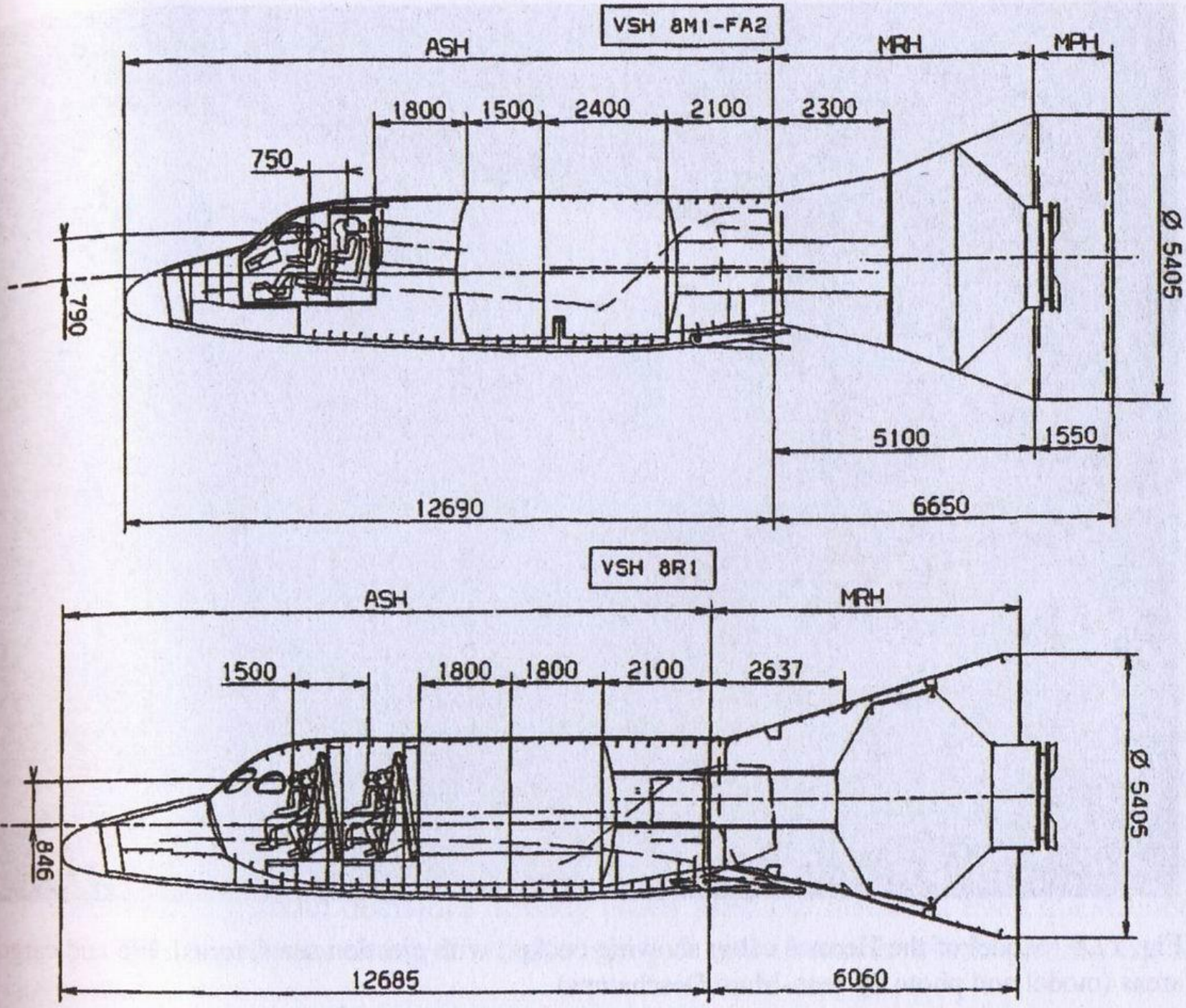


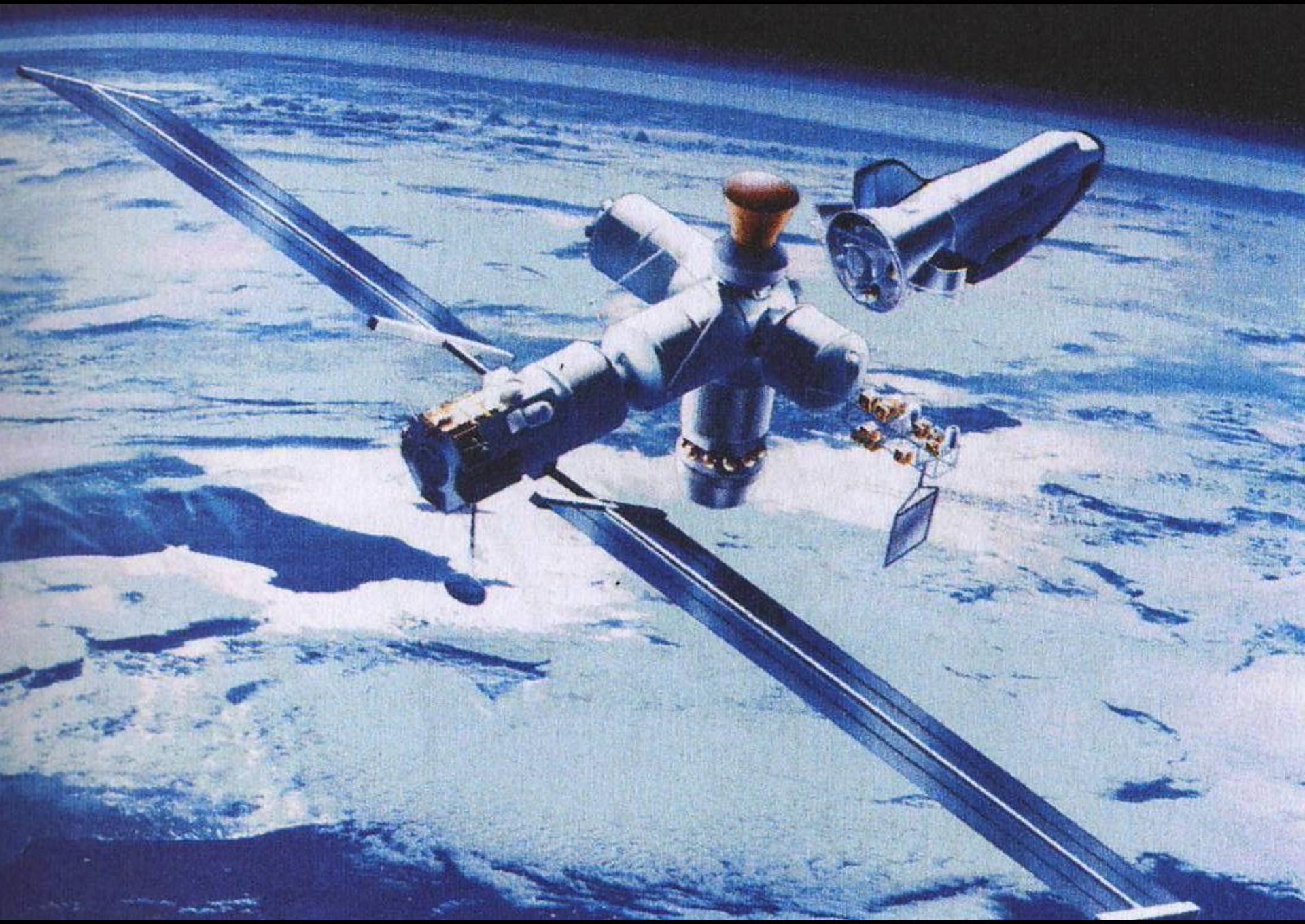

17245
4600
HERMES 5B
15429
4600
HERMES 5L-3
15429
4600
HERMES 5M1-3
12740
6600
HERMES 8M1-2
12875
5869
HERMES 8R1-3

FORME 294/8R1/1.0

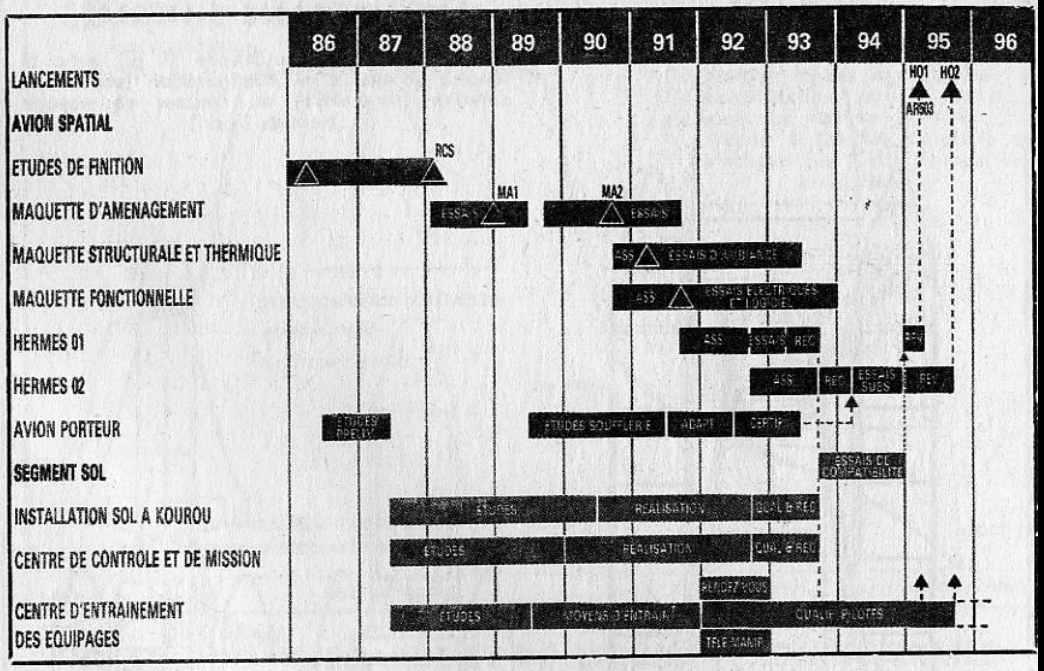


SURFACES PROJETEES SUR XY (M2)	
TOTALE	84.6 (84 AVEC DECOUPES)

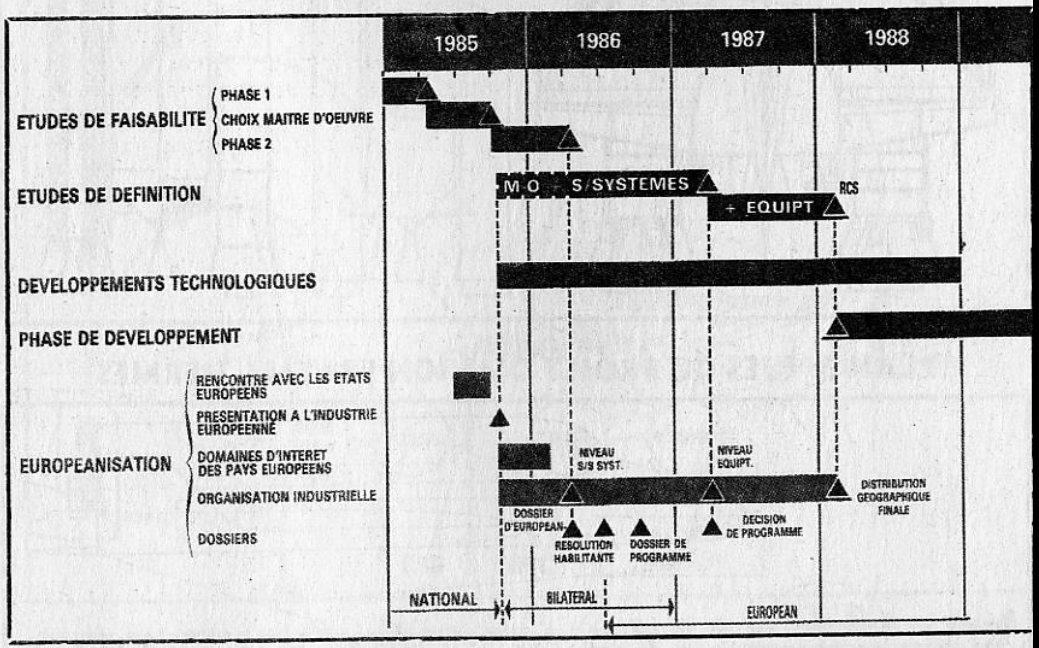

VSH 8M1-FA2
ASH
MRH
MPH
1800
1500
2400
2100
2300
750
790
Ø 5405
5100
1550
12690
6650
VSH 8R1
ASH
MRH
1500
1800
1800
2100
2637
846
Ø 5405
12685
6060



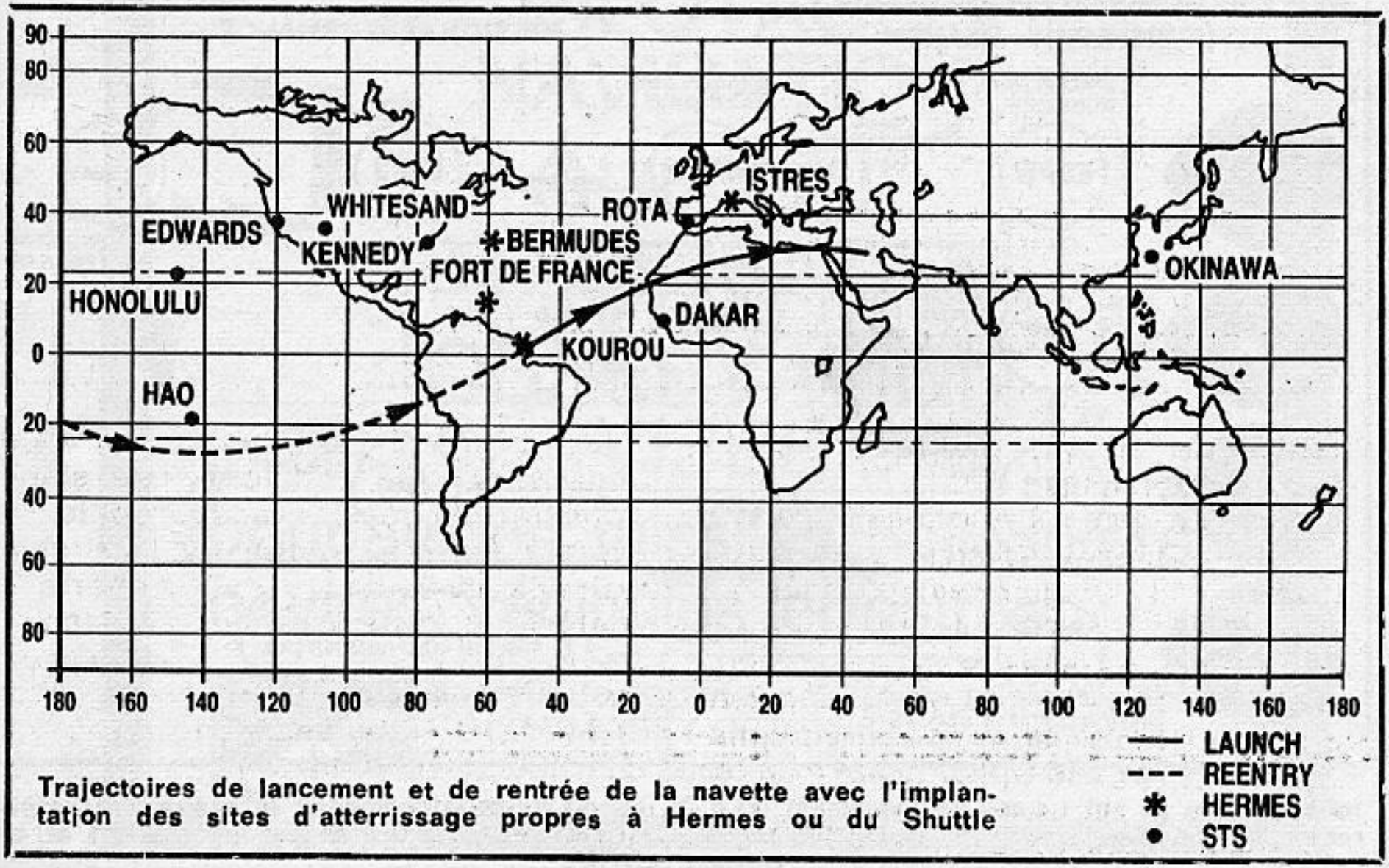
CALENDRIER GENERAL 1986-95 DU PROGRAMME HERMES



PLANNING A COURT TERME 1985-88 DU PROGRAMME



SITES D'ATTERRISSAGE DE L'AVION SPATIAL HERMES

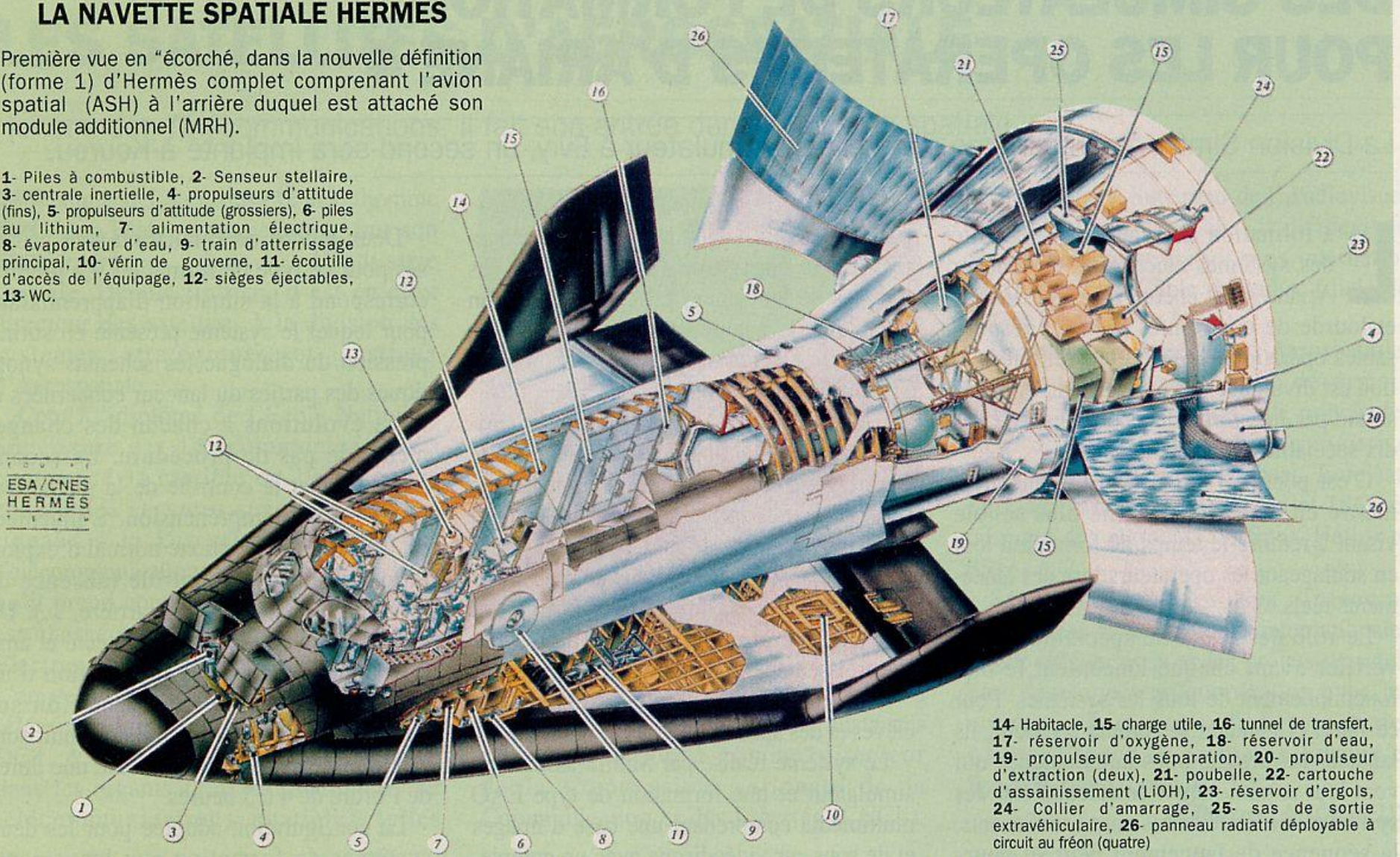


Trajectoires de lancement et de rentrée de la navette avec l'implantation des sites d'atterrissage propres à Hermes ou du Shuttle

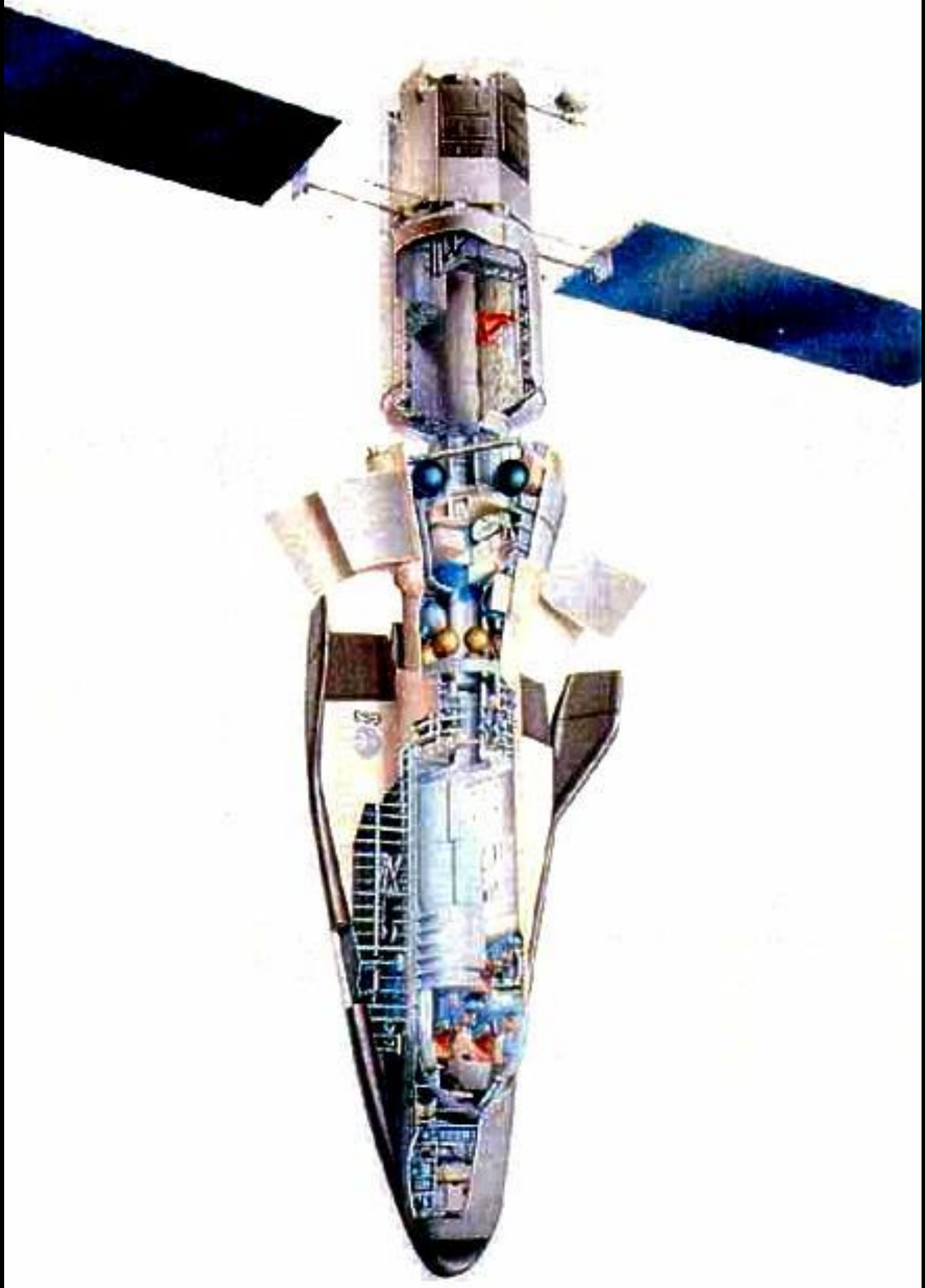
LA NAVETTE SPATIALE HERMES

Première vue en "écorché, dans la nouvelle définition (forme 1) d'Hermès complet comprenant l'avion spatial (ASH) à l'arrière duquel est attaché son module additionnel (MRH).

1- Piles à combustible, **2**- Senseur stellaire, **3**- centrale inertielle, **4**- propulseurs d'attitude (fins), **5**- propulseurs d'attitude (grossiers), **6**- piles au lithium, **7**- alimentation électrique, **8**- évaporateur d'eau, **9**- train d'atterrissage principal, **10**- vérin de gouverne, **11**- écoutille d'accès de l'équipage, **12**- sièges éjectables, **13**- WC.



14- Habitacle, **15**- charge utile, **16**- tunnel de transfert, **17**- réservoir d'oxygène, **18**- réservoir d'eau, **19**- propulseur de séparation, **20**- propulseur d'extraction (deux), **21**- poubelle, **22**- cartouche d'assainissement (LiOH), **23**- réservoir d'ergols, **24**- Collier d'amarrage, **25**- sas de sortie extravéhiculaire, **26**- panneau radiatif déployable à circuit au fréon (quatre)




HERMES


esa
esa
hermes

LA NOUVELLE SILHOUETTE D'HERMES X-2000

(en bleu, équipements ajoutés pour le vol orbital Hermès X-2000)